

BBC A3000 • ARCHIMEDES • BBC • MASTER

ACORN USER

MARCH 1992

STILL ONLY
£1.60

FANTASY FONTS

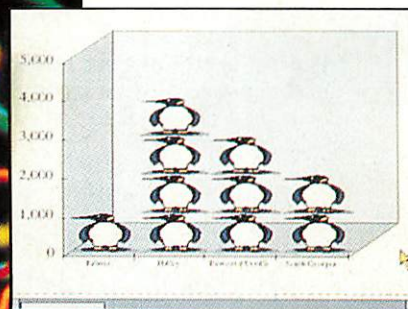
PACKAGES WHICH
ADD STYLE TO
YOUR LETTERS

Bulging



PIPEDREAM

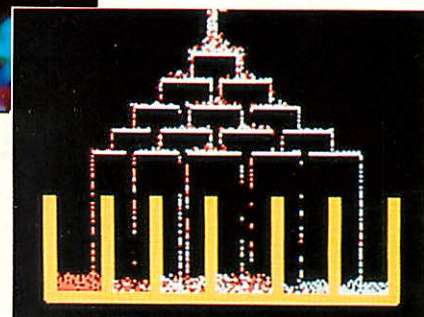
HOW GOOD IS THE
NEW VERSION OF
THIS SPREADSHEET?



ISSN 0263-7456

GO WITH THE FLOW

WATERY
SIMULATION ON
THE ARC



THIRD DIMENSION

THE ARC TAKES YOU INTO A 3D WORLD

WRITING MUSIC • DATA LOGGING FACTS • NEW GAMES

SQUIRREL

**THE REVOLUTIONARY NEW
DATABASE FOR ARCHIMEDES COMPUTERS**



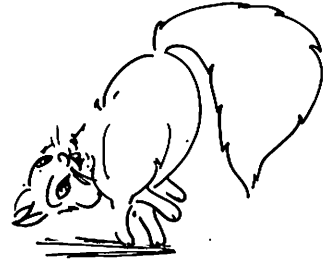
FRIENDLY

Squirrel is the easiest to use database yet, allowing simple point and click database creation and queries.



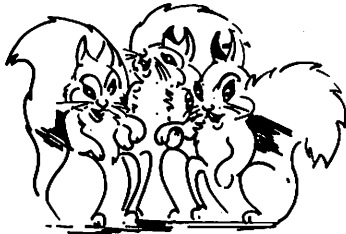
FAST

Modern indexing techniques mean superfast searches every time.



FLEXIBLE

Images, text and sound may be stored in the same database



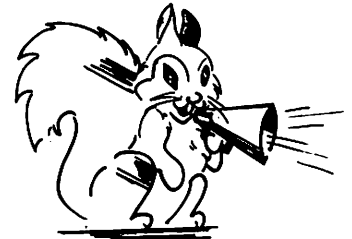
NETWORK COMPATIBLE

Client/server design ensures that squirrel runs just as well on networks as standalone.



INTELLIGENT

Squirrel understands days of the week, months of the year and recognises files from other popular packages.



COMMUNICATIVE

Queries may be made onto other popular computers such as an IBM or Macintosh, even remotely over telephone lines.



REPORTING

Fully relational reporting with an entirely new graphic approach to data selection.



PROFESSIONAL

Quite simply, the most professional database for Archimedes users.

Single User Version

£129.00 + VAT

Econet/Site Licence

£516.00 + VAT

Suitable for Acorn A3000, A310 and A400 Series.

digital services

DIGITAL SERVICES LIMITED

9 WAYTE STREET, COSHAM, PORTSMOUTH, HANTS PO6 3BS

TEL (0705) 210600

AVAILABLE NOW

There's something in the air!

Fantasy converts outline fonts to Draw files, following Draw paths and adding instant special effects

DrawBender distorts Draw files to the shape of a mould

Placard scales and prints Draw files intelligently across several sheets of paper

QuickKey puts your function keys on screen under mouse control, automatically showing the definitions for your current application

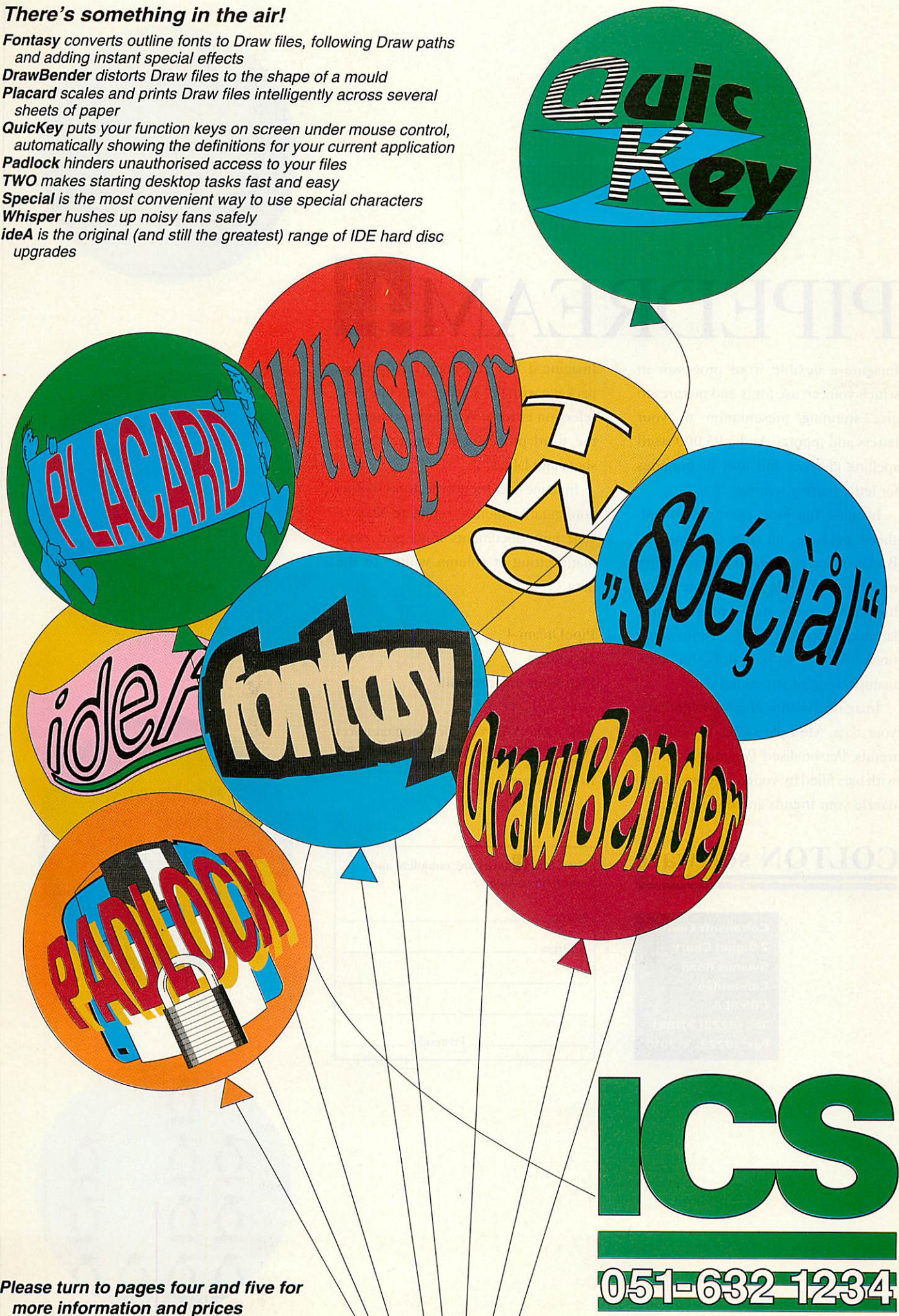
Padlock hinders unauthorised access to your files

TWO makes starting desktop tasks fast and easy

Special is the most convenient way to use special characters

Whisper hushes up noisy fans safely

ideA is the original (and still the greatest) range of IDE hard disc upgrades



Please turn to pages four and five for more information and prices

ICS

051-632-1234

PIPEDREAM4

Imagine a flexible word processor in which you can use fonts and pictures to give stunning presentation to your letters and reports. And a 93,000 word spelling checker and user dictionaries for letter-perfect writing.

Imagine the most powerful spreadsheet package on the Archimedes. Background recalculation so you carry on working while it computes. 160 built-in functions, plus a programming language for your own custom functions. Arrays within slots for easy manipulation of structured data.

Imagine dynamic charts straight from your data. Multiple scales to compare trends. Personalised Penguin Graphics with bars filled by your own draw files to dazzle your friends and colleagues.

Imagine a fast and compact database package with full sorting, searching and selection criteria. With links straight to the word processor for printing mail-shots and labels.

Imagine user-friendly features such as configurable menus, template files to start new documents from, and automatic fitting of column widths to the data.

PipeDream 4


the works

Free your imagination.

RRP £196+VAT. Call for education prices and site licences. PipeDream 4 is ideal for any Archimedes, A3000 or A5000 with 2MB RAM or more.

COLTON software

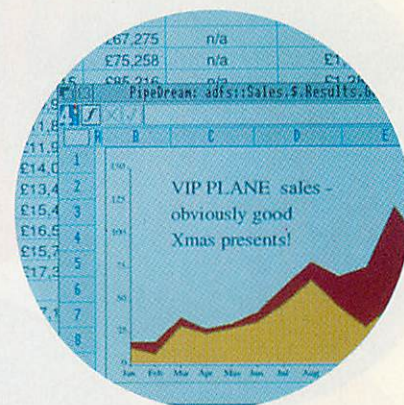
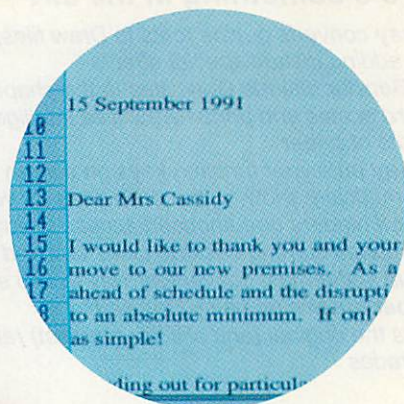
Coltonsoft Limited
2 Signet Court
Swanns Road
Cambridge
CB5 8LA
Tel: (0223) 311881
Fax: (0223) 312010

For a free  brochure, complete and return this coupon.

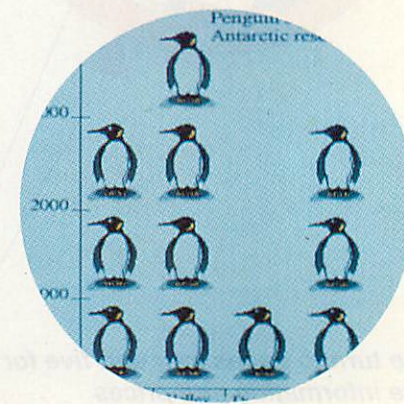
Name

Address

Postcode



	C	D	E	F	G
Grid x	2265	7264	48	SH	13
Grid y	2134	8345	45	WH	11
Munro	2970	7732	46	CG	7
Area	2266	7263	44	SH	13
Chap	2418	7875	43	CH	14
Pa	2212	7663	47	CH	8
	2144	8263	42	WH	10
	2470	7746	41	CH	1





COVER ILLUSTRATION
GEORGE SNOW

Editor Barry Monk
Assistant Editor Karen Donaghay
Technical Assistant Paul James
Art Editor Tony Judge
Editorial Assistant Sharon Halpern
Advertisement Manager
 Duncan Pringle
Deputy Advertisement Manager
 Richard Power
Sales Executive Areef Vohra,
 Jack Manzoor
Ad Production Fiona Andrews
Production Manager Jennifer Jeffrey
Publisher Seamus Geoghegan
Publishing Director Michael Potter
Editorial Director Christopher Ward

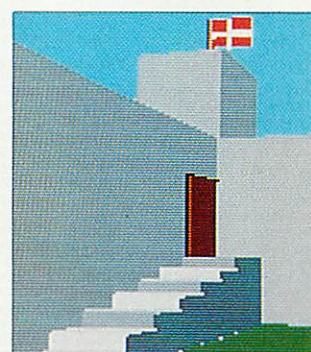
Published by Redwood Publishing,
 a BBC Enterprises Company, 20-
 26 Brunswick Place, London N1
 6DJ. Tel: 071-490 1444, Telecom
 Gold 10081:RED001, Micronet
 919992492. Bureau setting and
 ad typesetting by Bold Gray Design, 52
 Rosebery Avenue, London, EC1R 4RP.
 Colour by Trumps Studio, Ware, Herts.
 Printed by Riverside Press, St Ives PLC,
 Gillingham. Distributed by BBC Frontline,
 Park House, 117 Park Road, Peter-
 borough. © Redwood Publishing 1992.
 All rights reserved. Acorn is a registered
 trademark of Acorn
ABC Computers Ltd. Redwood
 Publishing is a registered
 data user. ISSN 0263 7456.

PRODUCED ON THE ARCHIMEDES

All the editorial pages in
 BBC Acorn User are
 produced on a DTP
 system using Acorn
 Archimedes 440/1 and
 A540 computers, Com-
 puter Concepts' *Impres-
 sion 2* with Laser Direct
 printers and Taxan
 monitors

NEWS	7
EDUCATION	13
COMMS	15
GRAPHICS	16
All that's new in the world of graphics	
NEXT MONTH	18
LETTERS	22
Your views on what's happening in the Acorn world	
QUESTIONS AND ANSWERS	24
SUBSCRIPTIONS	29
★INFO	49
Our regular dip into the feast of readers' programs and ideas	
ARC ASSEMBLY	58
The third part of our series looks at arithmetic on the Arm	
SETTING STANDARDS	61
The new printer code from Epson looks set to change the dot-matrix world	
WINDS OF CHANGE	66
Want to get weather data into the Archimedes? We look at the options	
FREE ADS	70
Bargain secondhand computers, software or peripherals. It's all here!	
GO WITH THE FLOW	71
Get your feet wet with our liquid simulation program	
HARD 'N' EASY	74
Suggestions on how to improve the organisation of your hard disc	
GRAPHS AND CHARTS	78
We look at some ways to portray your data more effectively	
YELLOW PAGES	81
PIPEDREAM 4	106
Is Pipedream 4 the last word in spreadsheets? We find out	
TAKE AIM	109
Image processing is fun. Find out just what Aim can do	
FLIGHTS OF FANCY	113
We test fly the new simulation designer from Simis	
FONTS	116
We check out packages that let you distort your words	
A NEW DIMENSION	119
3D Construction Kit – virtual reality in the comfort of your own home	
TAKING NOTES	123
We conduct a review of Notate, the new music package from Longman	
GAME SHOW	127
Our regular games column reviews this month's releases	
PUZZLE PAGE	136

119 3D DESIGN



66 DATA LOGGING



106 PIPEDREAM 4



123 NOTATE



**PLEASE NOTE OUR NEW ADDRESS
AND TELEPHONE NUMBERS
EFFECTIVE FROM ABOUT 10TH FEBRUARY**

1st Word Plus	Acorn	£62
- extra manual	Acorn	VO £10
3D Construction Kit	Domark	£42
A3000 Technical Reference Manual	Acorn	VO £30
A5000 Technical Manual	Acorn	VO £65
A540 Technical Guide	Acorn	VO £65
ABC Basic Compiler	Oak	£77
- ABX Utils		£39
Adventure Playground, age 5+	Storm	£16
Air Supremacy	Superior	£20
Alerion	Dabs	£13
Alien Invasion	Dabs	£13
All-In Boxing	Dabs	£13
Alpha-Base	Clares	£34
ALPS Adventure Language		
- Programming System	Alpine	£28
Amazing Ollie, age 4+	Storm	£13
Ancestry	Minerva	£59
ANSI C Release 3	Acorn	£124
- extra manual	Acorn	VO £19
Apocalypse	Fourth Dim	£20
Arcade 3 Compilation	Clares	£12
Arcade Soccer	Fourth Dim	£14
ArcComm 2	Longman	£54
ArcDFS	Dabs	£22
Arcendum	Dabs	£13
Archimedes Assembly Language	Dabs	VO £15
- with disc		£22
Archimedes First Steps	Dabs	VO £10
Archway 2	Simtron	£78
Arclight	Ace	£40
ArcMonitor	CIS	£22
Accounts Manager	Visionscan	£295
ARC-PCB	Silicon	£138
- Professional	Silicon	£269
- Schematics	Silicon	£475
Arclerm 7	Serial Port	£62
Arclitulate	Fourth Dim	£17
Arclist	Fourth Dim	£17
ArcTrivia	Moray	£21
Armadeus	Clares	£59
Artisan II	Clares	£43
ArtWorks	CC	EPOA
Astro	Topologika	£18
Atelier	Minerva	£63
Autosketch CAD	Autodesk	£65
Avon	Topologika	£16
Ballarena	Eterna	£14
Bambuzle	Arxe	£19
BASIC V Guide	Dabs	VO £10
BBC Basic Guide	Acorn	VO £19
Blaston	Eterna	£14
Blitz	Arxe	£17
BlowPipe	Eclipse	£14
Boogie Buggy	Fourth Dim	£17
Bookstore, age 7-16	ESM	£39
Break 147 & Superpool	Fourth Dim	£17
Broadcast Loader	Acorn	£63
Bubble Fair	Eterna	£14
Bug Hunter / MoonDash	Minerva	£13
Bug Hunter in Space	Minerva	£13
Business Accounts	Minerva	£298
Cambridge Pascal	Oak	£60
Cartoon Connection	Micro Studio	£16
Cartoon Line	Eterna	£17
Cataclysm	Fourth Dim	£17
Caverns	Arcana	£13
C: A Dabhand Guide	Dabs	VO £14
- with disc		£22
C Development System	Beebug	£77
Chameleon	4maton	£23
Charts & Graphs	Computer Tutorial	£17
Chaquered Flag	CIS	£17
- Extra Circuits	CIS	£16
Chess 3D	Micro Power	£14
Children's Graphics	Micro Studio	£16
Chocks Away	Fourth Dim	£17
- Compendium	Fourth Dim	£27
- Extra Missions	Fourth Dim	£14
Chopper Force	Fourth Dim	EPOA
Christmas Theme Pack	ESM	£34
Chuck Rock	Krisalis	£19
Clip Art	Graphics Factory	£19
- Vol 1 (General), sprites		£19
- Vol 2 (General) / Vol 3 (Animals) /		
- Vol 4 (Sport) / Vol 5 (Characters)	each	£25
Clip Art Set 1, drawfiles	Midnight	£26
Clip Art Set 2, drawfiles	Midnight	£29
Colfee, age 9+	Storm	£27
Colour Screen-Mac	Human	£90
- Arc/Mac Cable	Human	£24
Compression	CC	£39
Concept Designer	Longman	£22
Conqueror	Superior	£17
Control Logo	Longman	£22
Control Panel	Lingenuity	£14
Converta-Key	Triple R	£14
Cops	Alpine	£15
Corruption	Magnetic	£21
Craftshop 1	4maton	£27
Craftshop 2	4maton	£27
Creator	Alpine	£31
Crisis	CIS	£12
Cross-32 Meta-Assembler	Baldon	£175
- manual for evaluation	Baldon	VO £15
DataVision	Silicon	£110
DataWord	Triple R	£14
Decorated Alphabet, sprites	Micro Studio	£17
Designer V.3	TechSoft	£193
Designer Intro	TechSoft	£75
Designer's Graphics, draw/sprites	Micro Studio	£16
DeskEdit	RISC	£17

Desktop Assembler Release 2	Acorn	£119
Desktop C Release 4	Acorn	£185
Desktop Folio, new 1992 edition	ESM	£87
Desktop Office	Minerva	£70
Desktop Publisher	Acorn	£108
- extra manual	Acorn	VO £10
Detect-a-Pet, age 5-11	ESM	£49
DFS Reader	Beebug	£19
Disc Tree	Mitre	£37
DrawBender	ICS	£15
- site licence		£50
Dread Dragon Droom	Resource	£21
Dreamwave	EMR	£34
Drop Ship	Fourth Dim	£14
DTP Graphics 1 Mono, sprites	Micro Studio	£15
DTP Graphics 2 Colour	Micro Studio	£17
DTP Graphics combined	Micro Studio	£25
DTP Seeds	4maton	VO £8
DTP Theme Packs, age 5-16	ESM	
- Christmas		£35
- Editor's		£29
- Maths		£29

Easiword	Minerva	£16
EasiWriter	Icon	£120
- Dictionaries: Danish / French /		
- Norwegian / Spanish / Swedish /		
- Welsh each	EPOA	£30
Einstein	Ace	£30
Elite	Hybrid	£33
Elucidata (OCR)	Irlam	£155
- bought with Irlam Scanner		£79
Enter the Realm	Fourth Dim	£17
Equisor	CC	£39
E-Type Compendium	Fourth Dim	£17
Euclid	Ace	£40
Eureka	Longman	EPOA
Exotic Adventures of Sylvia Lain	Fourth Dim	£19
Face Off Ice Hockey	Krisalis	£22
Family Favourites	Minerva	£14
Farmer Giles	Computer Tutorial	£16
Farmer Giles II	Computer Tutorial	£16
Film-Maker	Silicon	£70
Financial Accountant	Silicon	£203
Finding the Way, age 5-	Rainbow	£7
Fine Racer	Eterna	£14
Fireball II Xtra	CIS	£12
First Impression	Word Processing	VO £28
First Words and Pictures	Chalksoft	£19
Flexilite	Minerva	£84
Flight Path, age 9+	Storm	£27
Flight Sim Toolkit	Simis	£36
Flying Start II	Mitre	£86
Fantasy	ICS	£25
Fantasy / DrawBender / Placard site licence		£80
FontFX	Data Store	£9
- site licence		£70
Font Pack - Newhall, Starter, Symbol	Acorn	£35
- each pack		
Font Pack 1 - Paladin, Swiss B,		
Symbol B, Vogue	Beebug	£47
Font Pack - Avant Garde, Bookman	CC	£20
Pembroke - each pack	Acorn	£75
Fortran 77 Release 2	Armado	£60
Fourier Analysis	Minerva	£13
Freddy's Folly	Topologika	£18
Freddy Teddy	Topologika	£27
- Ballons / The Zoo	Topologika	£27
- The Playground	Topologika	£27
- The Puddle / The Wardrobe	Topologika	£27
Freddy Teddy's Adventure	Topologika	£18
Fun School 2	Database	
- age 6, age 6-8, age 8+	each	£15
Fun School 3	Database	
- age 5, age 5-7, age 8+	each	£18
Gammaplot	Minerva	£35
Gate Array Design / Teaching	Silicon	£114
Genesis I	Oak	£40
Genesis II	Oak	£99
Genesis Plus	Oak	£69
Genesis Script Language	Oak	VO £16
GerberPlot	Silicon	£89
Giant Killer, age 10+	Topologika	£16
Giant Killer Support Disc	Topologika	£14
Good Impression	Word Processing	VO £27
GraphBox	Minerva	£55
GraphBox Professional	Minerva	£105
Graphic Writer	Clares	£24
Greetings Graphics, draw/sprites	Micro Studio	£16
GridIT	Longman	£30
Grievous Bodily ARM	Fourth Dim	£17
Gumshoes	Fourth Dim	£18
Hard Disc Companion	Beebug	£33
Hard Disc Companion release 2	Beebug	£44
Hearsay II	Beebug	£70
Herewith the Clues!	Micro Studio	£20
History Costume, sprites	Fourth Dim	£16
Holed Out	Fourth Dim	£12
- Compendium	Fourth Dim	£17
Home Accounts	Minerva	£34
Hostages	Superior	£14
Hotlink Presenter	Lingenuity	£40
House of Numbers	Chalksoft	£19
Hoverbod	Minerva	£13
Hyperbook Electronic Library (including Reader)	Longman	£109
Hyperbook Reader	Longman	£47
Ibix the Viking	Minerva	£14
IPC SWI	Baldon	£15
- bought with Oddule		£5
Illusionist	Clares	£76
Illustrators' Graphics, draw/sprites	Micro Studio	£16
Image Animator	lota	£68
Image OCR	lota	EPOA
Image Outliner	lota	£78
Imagine	Topologika	£33

Impression 2.15 or latest	CC	£125
- network version		£650
- site licence		£545
- extra hardware key for sites only		£15
- extra manual for sites only		VO £8
Impression Borders	CC	£12
Impression Business Supplement	CC	£39
Impression Junior	CC	£69
- site licence		£435
- extra manual for sites only		VO £7
Inertia	Fourth Dim	£14
Insight	Longman	£88
Instigator	Dabs	£39
Interdictor 2	Clares	£25
Investigator 2	Serial Port	£22
IronLord	UBI Soft	£14
ISO Pascal Release 2	Acorn	£75

Jahangir Khan World Championship Squash	Krisalis	£16
James Pond	Krisalis	£20
Jet Fighter	Minerva	£10
Jiglet	4maton	£25
Jigsaw	4maton	£27
Junior Database	lota	£51
Junior PinPoint	Longman	£24

Karbang	Eterna	£12
Keyboard Player	Chalksoft	£17
Knowledge Organiser	Clares	£42
Landmarks - Egypt / Rain Forest /		
World War / Victorians - each	Longman	£22
Last Days of Doom	Topologika	£16
Lemmings	Krisalis	£19
Letters and Pictures	Chalksoft	£17
Level 4 Fileserver	Acorn	£160
LISP	Acorn	£145
Little Red Riding Hood, age 5-8	Selective	£17
Logistix	Acorn	£77
Logo	Longman	£58
LogoPlotter	Longman	£19

Maddingly Hall	Minerva	£12
Mad Professor Mariari	Krisalis	£15
Magpie	Longman	£45
Mah-Jong European - The Game	CIS	£19
Mah-Jong Patience	CIS	£15
Mailshot	Minerva	£27
Man at Arms	Fourth Dim	£14
Manchester United Europe	Krisalis	£19
Manchester United Football Club	Krisalis	£19
Maps and Landscapes 1	Chalksoft	£19
Maps and Landscapes 2	Chalksoft	£67
Mark Master	Superior	£14
Master Break	Beebug	£19
Masterfile II	Micro Studio	£16
Mazes, drawfiles	CIS	£12
Memory Magic	CIS	£15
Mental Maths	CIS	£14
MicroDrive Golf	CIS	£11
- Extra Courses	CIS	£24
- World Edition	PRES	£199
Micro Trader Accounts	Domark	£28
MIG-29 Fulcrum	Domark	£30
MIG-29 Superfulcrum	Micro Studio	£16
Military History, sprites	Minerva	£13
Minotaur	Minerva	£13
Missile Control	Minerva	£13
Mogul	Ace	£15
Money Matters	Triple R	£15
Movaword	Chalksoft	£17
Mr Doo	CIS	£16
MultiFS	Arxe	£27
Multistore version II	Minerva	£155

Nature Graphics, draw/sprites	Micro Studio	£16
Nevryon	Fourth Dim	£14
Newton	Longman	£19
No Excuses	Arcana	£17
Nominal Ledger	Minerva	£78
Notate	Longman	£54
Note Invaders	Chalksoft	£17
Numbers and Pictures	Chalksoft	£17
Numerator	Longman	£63
Numerator Chaos	Longman	£19

Oak PCB	Oak	£136
Oak Recorder	Oak	£28
Office Tools	Silicon	£276
Ollie Octopus' Sketchpad	Storm	£13
Olympics	Fourth Dim	£14
Order Processing/Invoicing	Minerva	£78
Orion	Minerva	£13
Orrery	Spacetech	£93
Ovation	Beebug	£85
Overload	Clares	£13
Pacmania		£17
Padlock	ICS	£10
- site licence		£30
Pandora's Box	Fourth Dim	£17
Parametric Design Tool	Oak	£350
PC Access	Minerva	£19
PC Emulator 1.7	Acorn	£85
Pendown	Longman	£47
- Etole		£19
- Outline Fonts	Longman	£78
- Plus	Longman	£78
Personal Accounts	Apricote	£29
Phases#2	Northwest SEMERC	£15
Picture Book	Triple R	£14
PinPoint	Longman	£69
PipeDream 3	Colton	£105
PipeDream 4	Colton	£179
PipeDriver Dot 1	ICS	£10
Pipe Mania	Empire	£18
PIPP1 Primary Integrated Project Planner	CIS	£36

PIPP2 Professional Integrated Project Planner		
- 5-14 Programme	CIS	£85
- Middle	CIS	£52
- Primary	CIS	£44
- Primary: Homes	CIS	£12
- Resource Centre	CIS	£129
- Secondary	CIS	£69
Pirate, age 8-14	Chalksoft	£16
Placard	ICS	£10
- site licence		£30
Plague Planet	Alpine	£13
Poizone	Eterna	£14
Poster	4maton	£75
Powerband	Fourth Dim	£17
Prehistoric Animals, sprites	Micro Studio	£16
Premier	Circle	£71

- DataBase	Circle	£25
- WordProc	Circle	£25
Presentation System	Silicon	£61
Presenter GTI	Lingenuity	£62
Presenter II	Lingenuity	£29
Presenter Story	Lingenuity	£129
PrimeArt	Minerva	£69
Printer Driver, RISC OS		
- Epson, Star colour	Beebug	£15
- JX (Epson, Star and Citizen colour)	Ace	£13
- PJ (HP PaintJet Colour)	Ace	£13
Pro Artisan	Clares	£70
Prophet	Apricote	£134
Protex	Amor	£114
Provocator	Computer Tutorial	£15
Puncman 1 and 2	Chalksoft	£16
Puncman 3 and 4	Chalksoft	£16
Puncman 5 to 7	Chalksoft	£17
Purchase Ledger	Minerva	£78
Pysanki	Fourth Dim	£14

Quazer	Fourth Dim	£19
QuickKey	ICS	£5
- site licence		£45

Realtime Solids Modeller	Silicon	£132
Real McCoy	Fourth Dim	£20
Real McCoy 2	Fourth Dim	£20
Redshift	Minerva	£14
Render Bender I	Clares	£55
Render Bender II	Clares	£95
Reporter	Minerva	£29
Repton 3	Superior	£14
Revelation	Longman	£54
Revelation 2	Longman	£99
- CD Rom	Longman	£123
Reversals	Chalksoft	£17
Rhapsody 2	Clares	£45
RiscBASIC	Silicon	£112
RiscForth Compiler	Silicon	£110
Risc OS Companion Vol 1	Oak	VO £49
Risc OS Extras and Virus Kit	Acorn	£9
Risc OS Programmer's		
Reference Manual	Acorn	VO £79
Risc OS Style Guide	Acorn	VO £11
RoboLogo	Silicon	£69
Rockfall	Eterna	£14
Rotor	Arcana	£19

Risc OS Programmer's Reference Manual	Acorn	V0 £79
Risc OS Style Guide	Acorn	V0 £11
RoboLogo	Silicon	£69
Rockfall	Eterna	£14
Rotor	Arcana	£19
S ales Ledger	Minerva	£78
Saloon Cars	Fourth Dim	£17
Schema	Clares	£89
School Administrator	Minerva	£65
Science, drawfiles	Micro Studio	£25
Score Draw	Clares	£50
Scorewriter	EMR	

V iew+Mac 3	Human	£65
- Arc/Mac Cable	Human	£24
Vox Box	Clares	£47
W hite Magic	Fourth Dim	£14
White Magic 2 + Designer	Fourth Dim	£12
Wimp Game	Fourth Dim	£24
Wonderland	Virgin	£17
Words and Pictures	Chalksoft	£20
World Championship Boxing Manager	Krisalis	£23
World Geography Maps, drawfiles	Micro Studio	£42
World Map Study, age 7-16	EMR	£15
WorldScape	Eclipse	£16
World Wildlife, sprites	Micro Studio	£13
Worra Battle	Oak	£75
WorraCAD	Oak	£24
Worra Plot	Oak	£17
X -Fire	Fourth Dim	£15
Z 88: A Dabhand Guide	Dabs	VO £15
Z88 PipeDream Guide	Dabs	VO £15
Zarch	Superior	£14
Zelanites	Micro Power	£14

HARDWARE

A5000 COMPUTERS

2Mb Hard Disc Colour System	Acorn	£1499
- as above + Learning Curve		£1530

(Finance & special purchase schemes available)

MEMORY

Fitting extra unless otherwise stated

† Fitting easy ‡ Fitting needs expertise

A3000 2 Mb Non-upgradable †	IFEL	£55
-----------------------------	------	-----

A3000 2 Mb Upgradable †	IFEL	£63
-------------------------	------	-----

A3000 4 Mb †	Atomwide/IFEL	£149
--------------	---------------	------

A310 2 Mb Upgradable soldered ‡	IFEL	£99
---------------------------------	------	-----

- as above + MEMC1a		£149
---------------------	--	------

- as above + MEMC1a + fitting		£200
-------------------------------	--	------

A310 4 Mb soldered + MEMC1a ‡	IFEL	£225
-------------------------------	------	------

- as above + fitting		£277
----------------------	--	------

- as above + fitting + OS3 carriers	Atomwide	£298
-------------------------------------	----------	------

A5000 2 - 4 Mb Upgradable †	Atomwide	£500
-----------------------------	----------	------

A5000 4 - 8 Mb including fitting	Atomwide	£391
----------------------------------	----------	------

A540 4 Mb †	Atomwide	£268
-------------	----------	------

MISCELLANEOUS

4-slot 4-layer Backplane	IFEL	£59
--------------------------	------	-----

9060S Monitor	Elzo	£450
---------------	------	------

9070S Monitor	Elzo	£640
---------------	------	------

A300/400 Fan Kit	ICS	£15
------------------	-----	-----

A310 RISC OS Carrier Board ‡	IFEL	£25
------------------------------	------	-----

ARM3 ‡	Atomwide	£249
--------	----------	------

Clares Micro Mouse	Clares	£26
--------------------	--------	-----

Dongle/Dangle with screw fittings	ICS	£6
-----------------------------------	-----	----

Fan filters (pack of 10)	ICS	£4
--------------------------	-----	----

FaxPack	CC	£289
---------	----	------

Monitor Stand for A3000	ICS	£18
-------------------------	-----	-----

Whisper Fan Quietener	ICS	£15
-----------------------	-----	-----

HIGH DENSITY 3½" FLOPPY DISCS

Pack of 10		£10
------------	--	-----

PRINTERS

ArcLaser	Calligraph	£995
ArcServer	Calligraph	£985
Bubble Jet BJ-10e	Canon	£205
Bubble Jet BJ-300	Canon	£360
Bubble Jet BJ-330	Canon	£405
Laser Direct HiRes4 with 50-sheet tray	CC	£895
- with optional 250-sheet cassette		£999
Laser Direct HiRes8	CC	£1280
Laser Direct LBP-4 Card	CC	£319
Laser Direct Qume	CC	£799
LBP-4	Canon	£659
Refill toner cartridge for Canon EPS		£50
New toner cartridge for Canon LBP-4		£59

SCANNERS, DIGITISERS

ArcScanner including Epson GT-4000	Clares	£1660
FaxScan	Spaceteck	£94
FX9600AT + Maintenance	Amstrad	£376
Hawk V9	Wild Vision	£199
- A3000 version	Wild Vision	£278
Image (colour)	Irlam	£589
Image Scanner	Iota	£389
- Colour upgrade	Iota	£98
I-Scan 200	Irlam	£539
I-Scan 400	Irlam	£589
Pineapple Colour Video Digitiser	Pineapple	£195
- A3000 boxed	Pineapple	£230
Scan-Light A4	CC	£277
- with Sheet Feeder	CC	£370
Scan-Light Junior	CC	£128
- A3000 internal	CC	£128
Scan-Light Junior 256	CC	£199
- A3000 internal	CC	£199
Scan-Light Professional	CC	£825
- as above + SCSI interface	CC	£910
Spectra	RISC	£545
- A3000 Internal	RISC	£545
- A3000 External	RISC	£565

I2C PRODUCTS

AnDi Oddule	Balidon	£49
I2C Adaptor (needed unless you already have an I2C socket)	Balidon	£10
I2C SWI (enhanced IIC Control)	Balidon	£15
- bought with Oddule		£5

KEYBOARD COVERS

Seal 'n Type (spill-proof)		
- Archimedes	Kador	£14
- A3000	Kador	£14

FUNCTION KEY STRIP ORGANISER

Arckey	ICS	VO £3
- pack of 4		VO £10

Thinking IDE?

Look at these examples of our

NEW LOW PRICES

➤ A3000 INTERNAL 40 MB - ONLY £399 !

20 MB £225 • 60 MB £549 • 80 MB £675

All with power save, write protect, I2C connector, etc
Miniature fan option for fully upgraded A3000s

➤ A3000 EXTERNAL 40 MB - ONLY £369 !

With power supply and metal case to hold two hard discs

➤ A300/400/500 SERIES INTERNAL 80 MB - ONLY £359 !

Prices includes interface card and all fittings

We use 1 inch high discs so two can be fitted in the same place - e.g. add an extra 40 Mb for only £195

PLUS A FREE Compression
WORTH £57 !

We offer a full range of internal and external hard disc upgrades and separates. Telephone for more details and friendly advice based on a year's experience in selling IDE products.

Think **ICS**

There's only one
Original



HOW TO ORDER

VAT: UK customers please add 17.5% to the total price, except for the zero-rated items marked VO. Our VAT number is 384 3312 56.

CARRIAGE IS FREE WITHIN MAINLAND UK IF YOU PAY ON ORDERING. Remember this when you compare prices!

Overseas carriage: If you are paying by credit card we will add airmail and insurance at cost. Otherwise please add £6 (Europe) or at least £12 (elsewhere) for each software item and send a pounds sterling bank draft payable in England, or Eurocheques for not more than £100 each.

Credit cards are welcome. We do not charge your account until your order has been fulfilled. The name and address for delivery of goods should be as known to the credit card company. If you are leaving an order on our answering machine please include your telephone number, the expiry date of your card, and your calculation of the total payment due.

Official orders are welcome. Payment is due in 14 days. Invoices are subject to carriage and late payment charges.

Site licences: please enquire if no price is shown.

All products, prices and specifications are offered in good faith and are subject to change without notice. Your order will receive our attention immediately, but suppliers sometimes keep us waiting. Goods are guaranteed but we do not supply them on approval.



AUTHORISED ACORN DEALER

ICS (Ian Copestake Software)

Dept B28, 1 Kington road, West Kirby, WIRRAL, Merseyside, L48 5ET

Tel: 051-625 1006

Fax: 051-625 1007

BEEBUG

The Archimedes Specialists

A3000 Hard Drive DTP System

If you have been thinking of getting an A3000 there has never been a better time.

This special offer provides an excellent system ready for immediate use. The hard drive, RAM and Ovation are all installed ready so you can simply turn on and start.

Ovation is the highly acclaimed package combining word processing and DTP. Widely used in education it offers a whole host of features and is powerful and yet simple to use.

Our high speed IDE drive was designed especially for the A3000. It has an access time faster than ST506 or 8 bit SCSI, features auto-parking and sleep mode and is fitted in the internal expansion slot.



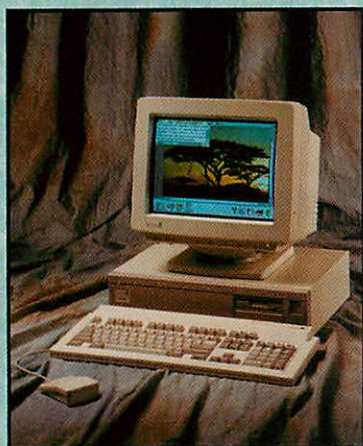
- ☐ Acorn A3000 Computer
 - ☐ Genuine Acorn Colour Monitor
 - ☐ Monitor Plinth
 - ☐ 2 Mb RAM
 - ☐ 20 Mbyte Internal Hard Drive
 - ☐ Ovation DTP
- Normal Price £1299 + VAT
Save Over £300

Special Offer £999 + VAT
(£1173.83 INC VAT)

The A3000 Learning Curve is also available if required. This includes Pacmania & Lemmings games, Genesis II Database, 1st Word Plus, Acorn PC Emulator and a 120 min audio training tape. Just add £40 + VAT (£47.00 inc VAT).

Courier Delivery Please add £9.00.

The A5000 Learning Curve



The A5000 is now available from BEEBUG, either from our showroom or mail-order.

BEEBUG are one of Acorns largest dealers and have been supporting the Archimedes range since its launch.

You can have total confidence in BEEBUG. Our technical team are always on-hand to provide any assistance and help that you may need with the A5000.

BEEBUG & RISC Developments also produce the magazine RISC User, dedicated to the Archimedes range.

BEEBUG - The Archimedes Specialists

A5000 Features

- ☐ RISC OS Version 3
- ☐ ARM 3 For Unbelievable Speed
- ☐ 1.6 Mb Format Floppy Drive
- ☐ 40 Mb IDE Hard Drive
- ☐ Acorn Multi-Scan Monitor

The New Learning Curve Pack

- ☐ New Multi-tasking PC Emulator
- ☐ Genesis 2 Database
- ☐ 1st Word Plus Wordprocessor
- ☐ Acorn DTP
- ☐ Lemmings and Pacmania Games
- ☐ Audio Training Tape
- ☐ Optional 300 dpi Ink Jet Printer

The A5000 Learning Curve Complete With Acorn Multi-scan Monitor Is Now Available For £1799 Inc.

Phone Or Write To Reserve Yours Now !

Courier Delivery Please Add £9.00.

Educational Establishments
Please Ask For Our Educational A5000 Price

0% Finance Over 12 Months NOW AVAILABLE ON THE A5000.

Deposit £179 Plus 12 payments of £135. APR 0%. Please ask for a finance application form.

BEEBUG

Phone Or Write For An Information Pack

All products covered by 12 months full warranty

Access / Visa / Switch / Cheque / Official Orders Welcome

Showroom hours Mon to Sat 9 am - 6 pm (Thu until 8 pm)

ACORN DTP PACKAGE TAKES ON THE MAC

ACORN and Computer Concepts have joined forces to launch an Archimedes-based desktop publishing system, targeted at equivalent PC and Apple Mac-based systems.

The DTP system includes Acorn's A540 computer, Computer Concepts' *Impression II* software, a Laser Direct printer and a professional image scanner. At just under £5000, the system offers 'higher performance and twice the print resolution for half the price of an equivalent Mac system,' according to Charles Moir, managing director of Computer Concepts.

The A540 features the Arm3 Risc processor, 4Mb of Ram, a 120Mb SCSI hard disc and is supplied with a 14in multiscan monitor. *Impression II* – which has sold around 15,000 copies and is used to produce this magazine's editorial pages – has eight Adobe-compatible families of fonts supplied as standard. Also included are: *Equasor*, an equation editing program, and CC's Business Supplement utilities (one group of which allows the



DTP SOLUTION – A540, IMPRESSION, PRINTER AND SCANNER

importation of files from packages such as *WordPerfect*, *Microsoft Word* and *Wordstar*; mail merging and the production of Postscript files.

The flatbed scanner can scan pages up to 8.5 x 14in at 256 grey levels with a resolution of 300 dots per inch. The Laser Direct printer can produce documents at up to 600dpi.

Acorn's marketing director, Mike O'Riordan, said: 'This system has a significant price performance advantage over

any equivalent Mac- or PC-based system. We expect it to attract a great deal of interest, not only from small businesses who may have been put off by the thought of introducing complex DTP systems, but also from printers who regularly carry out DTP work'.

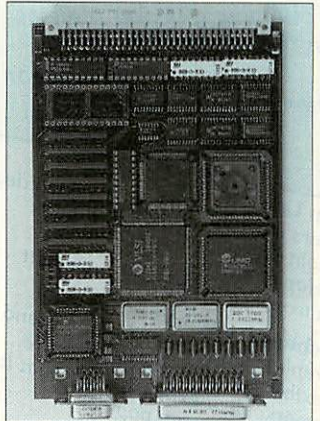
For further information on the new Acorn DTP package, contact Acorn Computers, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN. Tel: (0223) 245200.

PC ON A CARD FOR THE ARC

ALEPH ONE announced the launch of its PC Expansion Card for the BBC A3000/Archimedes – first revealed in this magazine last October – to educationalists at the recent BETT '92 exhibition.

The device, which is basically a PC on a standard module expansion card, enables applications that are designed for IBM-compatible PCs to run on Risc OS machines. According to Alex van Someren, Aleph One's technical director, the new card will 'provide significantly greater performance than Acorn's *PC Emulator* software.

'By using a real Intel 80386SX microprocessor and a single-chip PC motherboard, we have ensured complete hardware and software compatibility with IBM and compatible PCs'.



Parallel and serial ports allow peripherals, such as printers and modems, to be connected directly to the card and Aleph One expects the card to appeal to educational users who need to run PC applications.

The two versions of the card include a 1Mb at £595 and a 4Mb at £725. The card works with all Acorn Risc computers, including the BBC A3000 and Archimedes A5000.

● Aleph One has announced a further reduction in the price of its Arm3 upgrade for the Archimedes/A3000 to £199. Contact Aleph One, The Old Courthouse, High Street, Botolph Claydon, Cambridge CB5 9BA. Tel: (0223) 811679.

ARM COMPANY MOVES INTO CONTROL

ADVANCED Risc Machines, (Arm), the Arm chip development company formed between Acorn, Apple and VLSI Technology, has now concluded a licence agreement with GEC Plessey Semiconductors (GPS).

The new agreement enables GPS to manufacture and sell Arm's Risc processors, including the recently-announced Arm6, 60, 61 and 600 and encourage the extension of Arm's Risc technology into embedded control applications. The performance, size and relative low cost and power consumption make the Arm designs ideal for applications including telecom's,



ROBIN SAXBY FROM ARM (LEFT) WITH DOUG DUNN OF GPS

network controllers, automotive control and many more applications. For more details

contact Arm Ltd, Swaffham Bulbeck, Cambridge CB5 0NA. Tel: (0223) 813000.

What our readers say

...I would like to congratulate the publishers of RISC User for producing an excellent journal, the presentation of which is neat and stylish and the content lively and informative...I think that now you have achieved a good balance between articles for the novice and advanced user...

K. Gomm

...I find your magazine to be the best available for the Archimedes range of computers, and I am sure I have obtained far more information about the workings of these machines than all the others I read.

D.A.Symes

...I must commend you on your most excellent publication that keeps my interest at all times.

N. Dennigan

...RISC User provides additional information not frequently covered in less specialised magazines.

M.Rozdoba

...I find the Technical Queries and Hints & Tips extremely useful - they have helped me unravel many a problem. Keep up the good work!

P.J.Matthew

...Congratulations on your articles for beginners, we could certainly do with more of them.

J.H.Luxton

...I wish to congratulate you for the continued excellence and highly interesting nature of your magazine, and sincerely hope that you will be able to maintain these standards for a long time to come.

S.J.Hasleton

Following glowing reviews in the computer press ...

... a new version of **DeskEdit** (V 1.20) has now been released

Acorn User
...offers much to the user... a good deal of thought has evidently gone into its development...

Archimedes World
...replete with well thought out and flexible features... very attractive... remarkably inexpensive for what it offers... should prove very popular.

Archive
...a wonderful piece of software... deserves to be on everyone's icon bar... Acorn would do well to provide it free with every machine it sells... so much (is provided) that you wonder how you managed before.
...macros are... a boon and of great value when writing a program... a truly marvellous set of page and printer control options are included... Everything I wanted was there with clear instructions for use. DeskEdit is a must.

DeskEdit

is the ultimate all-purpose editor for the Archimedes, with special features for plain text, Basic and C source.

Edit your Basic programs on the desktop and test them interactively with a single key press.

with even more features for text editing and word processing tasks, Basic and C source editing

A new **single key save-and-run** feature in Basic mode permits virtually instantaneous testing of programs and applications as you edit them.

The **improved procedure and function browser** now lets you browse in both directions

In text mode, **wordwrap** control is improved, while in **C mode syntax checking** is extended, and a special Search option lets you search for function definitions.

Other **new features** are:

dynamic date insertion • Left and Right Justify • bracket matching • Align Columns and • the Char Info option.

DeskEdit + a 48 page manual + a function keypad
Price **£24.95** inc + £1.50 p&p Code **PEDTb**

Existing users may upgrade to V. 1.20 by sending their original disc, together with £2.00 and SAE marked **DeskEdit Upgrade 1.2.**

ChartWell

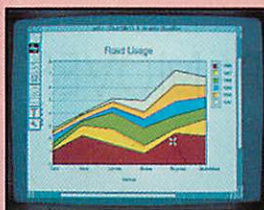
A sophisticated Graph and Chart Package

ChartWell offers **24 different graph types**: horizontal and vertical bar charts line graphs scatter charts polar plots and pie charts.



Data can be imported from other applications, such as spreadsheets, databases, or created with a suitable editor as a text file.

Output is in standard Draw format for import into Draw or any other application, DTP for example.

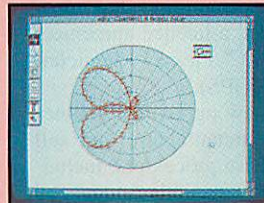


A variety of display options:

flat or 3D bar and pie charts, user choice of angle for 3D pie chart display, clustered, stacked or layered bar charts, scatter graphs with choice of curve fitting techniques, regression lines and correlation coefficients, and use of error bars, line graphs with choice of normal, cumulative area or stacked area displays.

Complete user control over:

choice of colour, data point styles, bar widths and spacing, use of titles and labels, legends to provide a key, graduated/shaded backgrounds, scales and tick marks, etc.



Use of 'style sheets' allows a set of options to be saved with data for future reference. User choice of start-up options.

A single chart or graph can display up to **6 different data sets**, including up to six pie charts in a single display.



Flexibility - you can select only part of the data for display, or change the order of display - i.e. which bar charts data can be arranged in ascending order.

Chartwell and manual
Price **£29.95** inc + £1.50 p&p
Code **PCHWa**



FULL MOTION VIDEO SYSTEM FOR THE ARC

A **NEW** full motion video system, (FMV), combining the processing power of Arm-based Risc machines and the mass storage capabilities of CD-Rom, has been launched by Acorn. Acorn Replay allows an Archimedes computer and a CD-Rom drive to be combined to harness the potential of full motion video as part of a multimedia system.

Simultaneous audio and video is supported, with the system running at up to 25 frames per second. The display can run in the Risc OS desktop, or in a low resolution full screen mode. Full motion video work is restricted in the personal computer market by the storage and performance requirements of video.

For example, one minute of quarter screen 25 frames per second, 256-colour VGA video contains some 115Mb of data which has to be painted

on screen at 2Mb/sec. Most PCs have to resort to hardware to assist the process, or accept limited video frame rates or lengths.

Acorn Replay differs from other FMV systems in that it reads highly compressed data from mass storage devices in real time on a standard product with no additional hardware, yet it maintains a constant frame display rate.

The system features a data compression technique which relies on calculating the redundancy between successive video frames, achieving compression factors of between 25 and 40. The software decompression algorithm runs in real time on all Archimedes computers that have at least 2Mb of memory available.

The user can stop the video at any point and 'grab' a frame for pasting into other desktop applications, such as DTP.

Acorn has been working with third party software houses to generate applications incorporating Acorn Replay. Third parties are also being encouraged to produce CDs containing compressed video clips and these could then be used as libraries of clip art for personal applications. The first CD titles should be available from next month.

Acorn's technical director, Malcolm Bird, said: 'Acorn Replay can be used either as a stand-alone system to display film clips, or integrated with a controlling application to provide a video display service to that application, such as a database, an encyclopaedia, or a hyperbook.'

For further information on the full motion video system, contact Acorn Computers, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN. Tel: (0223) 245200.

MONO DIGITISER UNDER £50

HCCS has come up with a range of black and white digitiser for the BBC A3000 and Archimedes which start at less than £50.

The new Vision digitisers are designed to take any video signal – from a video cassette recorder, camcorder, laser disc player, and so on – and turn it into a high-quality black and white sprite in a window on the Risc OS desktop.

The image takes approximately 5sec to materialise, but the image capture is in real-time, in other words within one video frame. Image size is 640 pixels x 256 lines, with 128 effective grey scales using ETT (error transfer technique).

The digitiser has been designed to incorporate a fast preview mode for focusing and setting up video sources, which can be processed fully at any time. The software included has additional features such as on-screen contrast and brightness controls, which can be adjusted easily before or after the video frame is captured. This should enable the user to obtain the best results, first time.

The standard sprite file produced can then be saved and edited under *Paint* or other programs, perhaps to become part of a demo sequence, or to add to DTP documents.

Three versions of the digitiser are available: an internal version for the A3000 (£49), an external version for the A3000 (£69) and a half-width module version for the Archimedes (£49).

A colour upgrade for the digitisers is expected to be launched in June and will cost approximately £30, with a discount to existing users. All prices exclude VAT.

For more information on the range of digitisers, contact HCCS Associates Ltd, 575-583 Durham Road, Gateshead NE9 5JJ. Tel: 091-487 0760.

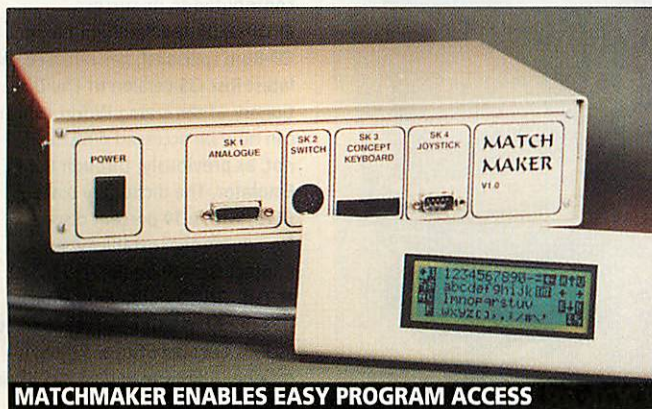
MEET YOUR MATCH

SRS SYSTEMS has come up with a new device which enables people with special needs to operate standard software on the Archimedes and the BBC A3000.

The Matchmaker unit allows the connection of virtually any input device (switch, joystick, trackerball, concept keyboard, and so on) to the computer,

enabling access to most available 'off-the-shelf' programs.

The speed and sensitivity of the device can be selected easily. The unit also has a keyboard and mouse emulator that are compatible with most available programs. For further information on the Matchmaker unit, contact SRS Systems on 021-643 2877.



MATCHMAKER ENABLES EASY PROGRAM ACCESS

BETTER BETAJET

INTEGREX has launched what it claims is a laser-quality inkjet printer for £199. BetaJet is a high-resolution, A4 monochrome inkjet printer which is said to give 'laser quality output at a 9-pin dot matrix cost'.

The printer emulates the HP Deskjet Plus as standard, with Epson FX 850 and IBM Proprinter emulation available on optional memory cards.

Printing at 160cps draft and 80cps LQ (letter quality), with an 8K buffer, the printer can output pages at the rate of up to two per minute. Resident fonts include Courier, Letter Gothic and Times Nordic, with additional fonts available.

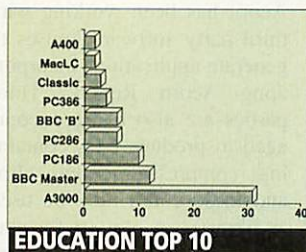
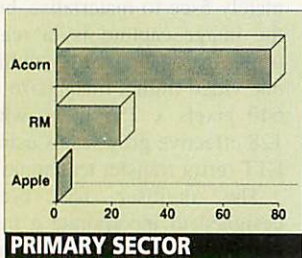
For more details on the BetaJet printer contact Integrex Ltd, Church Gresley, Swadlincote, Derby DE11 9PT. Tel: (0283) 551551.



ACORN KEEPS LEAD IN SCHOOLS MARKET

ACORN has maintained its leading position in the UK schools marketplace, according to a recent survey*, with total penetration of around 64 percent for the period April to September 91.

Acorn's penetration was greatest in the primary sector, where the company picked up 77 percent of purchasers, compared 23 percent for Research Machines (Nimbus). In the secondary sector, they were



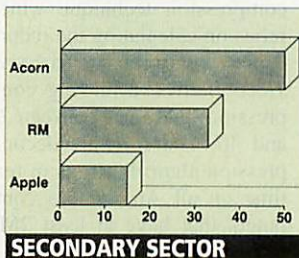
still the biggest sellers, with around half of the purchasers buying Acorn machines. Brand share for Acorn across all schools was 53 percent – 74 percent in primary schools and 42 percent in secondary.

Serious attempts have been made by rival manufacturers, notably RM and Apple, to increase their share of the education cake but, despite this, Acorn's brand share across all schools was practically

unchanged compared with a similar survey carried out for the same period in 1990.

The BBC A3000 is still the most popular school computer, (see the adjacent chart) followed by the faithful BBC Master. For further information, contact Acorn Computers, Fulbourn Road, Cherry Hinton, Cambridge CB1 4JN. Tel: (0223) 245200.

*Survey by Research Support and Marketing



WHAT A BIND!

REGULAR readers who have been waiting patiently for a new set of binders to store their favourite magazine can relax – they're here! Each new binder costs £5.95, is finished in white with our current *BAU* logo and is designed to hold 12 issues of the magazine. To obtain yours, please complete the coupon below and send it with a cheque made payable to Redwood Publishing to: *BAU* Binder Offer, PO Box 66, Wetherby LS23 7HL.

BBC ACORN USER BINDERS
Please send me.....binder(s)
@ £5.95 each

Name

Address

NEW CUB COLOUR MONITOR

MICROVITEC has added a new high resolution colour monitor to its Cub range. The Auto Scan 2038, seen below linked to an A5000 machine, features a 20in screen and is said to provide high-quality definition and colour.

Intended for high resolution and business graphics applications, the 2038 is compatible with the BBC A3000, and the

Archimedes range of computers. The company claims to have sold 330,000 Cubs in the UK alone, and offers an unconditional warranty, lasting three years, on all monitors sold into the education market.

The Auto Scan 2038 costs £1495. Contact Microvitec, Futures Way, Bolling Road, Bradford BD4 7TU. Tel: (0274) 390011.



MICROVITEC'S AUTO SCAN 2038 WITH AN A5000

IN BRIEF

● **COURSES** covering the use and management of Econet networks, originally held only at Acorn's Cambridge headquarters, have been extended to three regional training centres. The courses are now being held at venues in Surrey, Manchester and Durham and are being run by experienced Acorn-contract trainers, although the administration will continue to be handled centrally from Cambridge. For further details on the courses, which will be run from next month, contact Acorn on (0223) 245200.

● **ACE COMPUTING** has produced a printer driver for Hewlett Packard's recently-released 300dpi colour printer. It costs £18.80, including VAT, postage and packing. The company is also working on a driver for Risc OS 3 (the A5000). Contact Ace Computing on (0223) 322559.

● **SPACE** enthusiasts will be interested to hear that data from NASA, the American space agency, is now available on CD-Rom from Spacetechn. The Planetary Data System discs contain planetary images and data, organised in directories so that it is easy to work through. For details, contact Spacetechn (0305) 822753.

● **EXPLAN** has launched the desktop version of its Arcol colour art program for the Archimedes. The program operates in all full-colour screen modes. It costs £50 (single user), £250 (site licence) and £6.50 to upgrade from previous versions. Contact Explan on (0822) 613868.

● **AROUND 40,000** copies of the hypermedia package, Genesis, are being used in the Acorn marketplace, according to Oak Solutions. The company claims that the success of Acorn's Learning Curve, which includes the package, has contributed to its success.

● **OPTECH**, the Farnham-based CD-Rom specialist, has released the latest Risc OS version of The Dictionary of the Living World, which can now be accessed direct and not, as previously, through the PC Emulator. The dictionary costs £175, with a 10 percent discount for educational establishments. Contact Optech on (0252) 714340.

● **THE THIRD** Acorn Education Directory has just been released. It includes details of over 1700 educational titles and costs £4.95 from Acorn dealers.

A revolutionary new database which could change the way you think and work

PinPoint: Smoking, answer sheet: 1

Meadowfield School **SMOKING ACTION COMMITTEE**

SMOKING AND HEALTH SURVEY

1. How old are you? 11 years

2. Are you: ☒ Male ☐ Female

3. Do you smoke cigarettes? ☒ Yes ☐ No

If your answer to question 3 is no, please go straight to Section 3

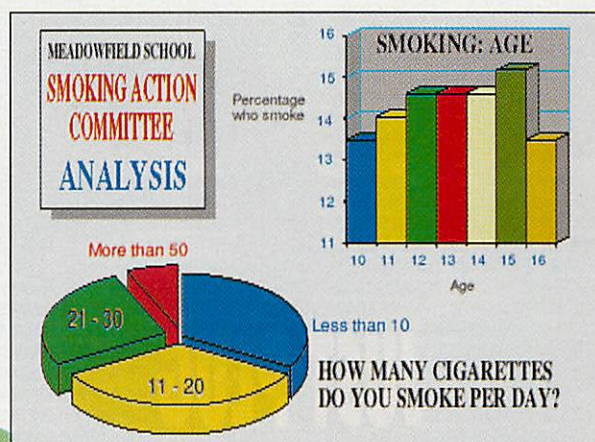
4. How many cigarettes do you smoke per week on average? ☒ Less than 10 ☐ 11 - 20 ☐ 21 - 30

SECTION 1 Personal Details

SECTION 2 For smokers

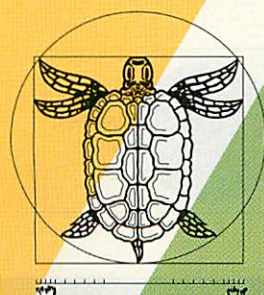
The idea behind *PinPoint* is as simple as it is revolutionary. Imagine a program which allows you to design and print any form as easily as using the best DTP package. Suppose, as your design takes shape, you are simultaneously building a complete database to handle the information your form can display. Perhaps you want to enter information directly onto the form electronically, with no need to use paper. Or your data can be entered from completed paper forms using the latest WYSIWYG data entry techniques, optimised to save time.

The information you collect can be sorted, selected, statistically analysed and presented graphically in any number of ways. The powerful object-oriented graphing and presentation tools give you 2D and 3D pie charts, bar charts, line graphs, scattergraphs and lines of best fit. You can also browse through information in tabular form, rearranging or eliminating rows and columns. Information can be freely exchanged between *PinPoint* and other RISC OS applications. Instead of a database, a spreadsheet, a graphing package and a DTP program, you now only need...

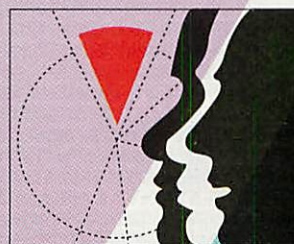


PinPoint

Information collection and analysis, all in one.



LONGMAN LOGOTRON
124 Cambridge Science
Park, Milton Road
Cambridge CB4 4ZS
Tel. (0223) 425558
Fax (0223) 425349



Features:

- ▼ Wide choice of database design for graphical analysis
- ▼ WYSIWYG data entry using mouse or keyboard
- ▼ Frequency, Percentage, Popularity and Cumulative Frequency field analysis
- ▼ Powerful table style information browser
- ▼ Full sorting and selection of records
- ▼ Ability to calculate a wide range of statistics
- ▼ Multi-file analysis
- ▼ OOP presentation tools
- ▼ Full information exchange from other RISC OS packages, using text, CSV and draw files.

PinPoint, for the Acorn Archimedes, is priced at £99. A Site Licence costs £400. For more details please contact us.



fax

pack

FaxPack is a fax expansion board for the Archimedes range of computers allowing your computer to take on the job of a conventional fax machine but with the benefits of being fully integrated into the Archimedes.

FaxPack offers full background send and receive capability. You can send a fax simply by selecting the PRINT option from any RISC OS application, with control returned in just a few seconds. FaxPack then proceeds to dial and send the fax while you carry on using the computer.

Receiving faxes is also completely automatic. FaxPack will answer the phone and store the fax away on your disc while you continue to use the computer. Once received the fax can be viewed on screen (using a special anti-aliased display to improve on-screen readability) and printed. Any portion of the fax image can be saved as a conventional sprite. Alternatively FaxPack can be made to automatically print on receipt of a fax, which with a LaserDirect printer, is completely automatic and in the background.

There are numerous advantages of a computer based fax system over a conventional machine:

- ☐ Very high quality, pixel perfect faxes - try sending a fax of 8pt text from a conventional fax machine!
- ☐ Since there is no need to print, then re-scan a document, FaxPack saves time, paper and money when sending faxes.
- ☐ Rather than junk fax mail wasting your costly fax paper, you can decide to delete unwanted fax files before printing.
- ☐ By receiving and sending from the computer FaxPack offers a higher level of security than most conventional fax machines.
- ☐ FaxPack allows electronic archiving of fax messages and is one step towards the truly paperless office.
- ☐ FaxPack uses your standard Archimedes printer and so can print on plain paper rather than thermal paper.

In addition FaxPack can be used as a data modem, to send and receive any Archimedes file or directory of files to other machines fitted with FaxPack. Because of the 9600 baud rate of fax systems and the use of data compression FaxPack is faster than practically all conventional data modems and permits background data transfer.

FaxPack £299 + VAT (£351.32)



Computer Concepts Ltd

Gaddesden Place, Hemel Hempstead,
Herts, HP2 6EX.

Tel.: 0442 63933 Fax: 0442 231632

APPROVED for connection to
telecommunication systems specified
in the instructions for use subject to
the conditions set out in them.

THE FAX EXPANSION BOARD FOR THE ARCHIMEDES



GOING FOR GOLD AT BETT

THE SUCCESS of *Desktop Folio* (Archimedes), the 'interactive' writing package from ESM, was affirmed last month when it secured the gold award in the primary category of the Educational Technology Awards. A silver award went to Sherston Software for *Viewpoints*, its mapping and database program for the Archimedes. Two companies were jointly awarded the bronze; Black Cat Software for *Clipboard* (Nimbus), a datahandling package and Broderbund for *Kidpix* (Apple and IBM PC), a painting package.

In the secondary category, the gold award was presented to The Times Network Systems for its bundling of the Times CD-Rom disc with the Toshiba CD-Rom drive. Research Machines' Nimbus Notebook NB220 took the silver award. The bronze award went to *World Development Database* (Nimbus and Archimedes) from CWDE



THE AUTHOR OF DESKTOP FOLIO RECEIVING THE GOLD

Software. It uses *Grass*, a datahandling package, and the judges felt that not only was it useful in itself, but it was to be commended for extending on an already existing product.

This year, special presentations were also awarded to Northwest SEMERC for its contribution to special educational needs, especially for *Phases#2* and *My World*.

Sponsored by *BBC Educational Computing and Technology* magazine, the awards were presented at the opening ceremony of BETT '92 by the minister of state for education, Tim Eggar. In making the presentations, he highlighted the need for support in IT and stressed the growing importance of technologies such as CD-Rom.

NEWS IN BRIEF

● **DESKTOP FOLIO** users will be glad to hear that ESM has added Editor's Pack and Maths Pack, £29.50 each, to its range of support materials for the award-winning program. Also released for the Arc is Bookstore, £39.50, a simple database of book reviews, which pupils can browse through and add their own, and Archimedes World Map Study, £42.50, a map-based database. Contact ESM on (0223) 65445.

● **NOT TO BE** left out, Sherston has adapted two more of its BBC titles to run on the A3000. In *Toby at the Seaside*, £25, pupils practice science and language skills with the help of Punch and Judy, and in *Wizard's Return*, £21, they can become a dragon-friend for life, by completing the mathematical adventures. The BBC Emulator needed to run the two programs is included on the discs.

Network versions are now available for some of its BBC programs, along with photocopiable resource packs. For more details contact Sherston on (0666) 840048.

● **PIP INVESTIGATES** Dinosaurs is an adventure and database program, based on the popular character, Pip. Suitable for key stage one, it costs £27.50 and is available from Northern Micromedia on 091-270 0424.

● **LONGMAN** Logotron has upgraded its painting and drawing package, *Revelation*, to include extended colour mixing, additional image effects and more drawing tools. *Revelation 2* comes in both floppy disc and CD-Rom format, costing £119 and £139 respectively.

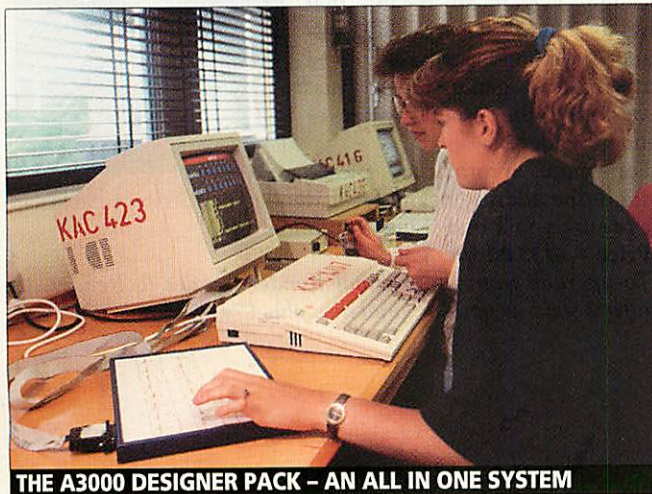
At £69, *Insight* is a data logging package for the Archimedes which can be used with most interfaces. It has two programs, and these allow a wide range of experiments to be carried out. Contact Longman Logotron on (0223) 425558.

● **PRIMARY** Archimedes Toolbox Plus was designed by teachers to meet the software needs of primary schools using an Arc. It contains a wide range of applications, including a selection of Printer drivers and fonts, the primary wordprocessor *Pendown*, and *DataSweet2*, a datahandling package, plus photocopiable guides to using the computer and software. Prices start at £80. Contact the Hampshire Microtechnology Centre on (0705) 378266.

A3000 DESIGNER PACK

A CONCEPT Keyboard provides an alternative means of accessing computer software. Now The Concept Keyboard Company has bundled its CK with Longman Logotron's general overlay designer and editor, *Concept Designer*. This includes *TouchData*, similar to the original *Touch Explorer*

Plus, and *SoftTouch*, so an overlay can be designed without a CK attached. The A3000 Designer Pack costs £136 (A4), or £152 (A3), from The Concept Keyboard Company on (0962) 843322. A further £50 reduction is available if you trade in an old keyboard (QWERTY or Concept).



THE A3000 DESIGNER PACK - AN ALL IN ONE SYSTEM

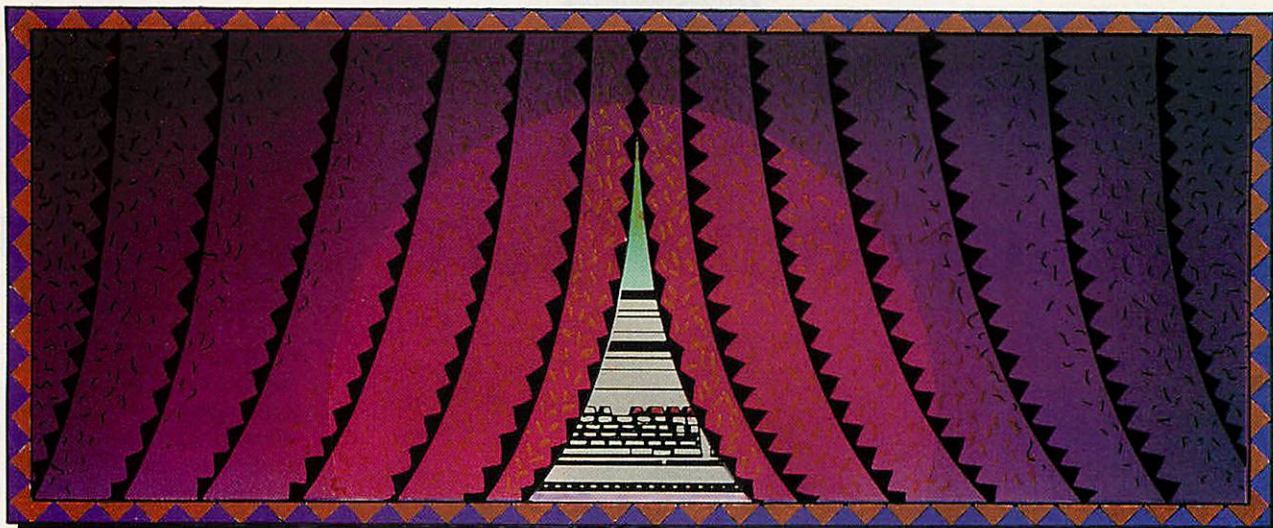
CASH BACK

THROUGH an initiative launched at BETT '92, Cumana aims to put £100,000 back into education. Under the Cumana Cashback Club scheme, schools can raise funds, to spend as they like, simply by distributing Cumana catalogues, printed with their own membership number.

Each time a customer places an order quoting that number, the school will collect a cashback value of five percent. To obtain the catalogues, ring the Cashback Club Hotline on (0483) 440603.

If you are considering investing in CD-Rom, you will be glad to hear that Cumana's range of SCSI interfaces for the Arc includes an option called *EasyShare*, enabling a group of computers to share a single peripheral, such as a CD-Rom drive, without the need for networking. Phone Cumana on (0483) 440603.

Sharon Halpern



What does everyone who creates moving pictures want?



A sneak preview.

Render Bender is the graphics package that allows the user to produce remarkable animated graphic sequences using Ray Tracing.

Ray Tracing isn't nearly as complex as it sounds. Basically, in a ray traced sequence, every pixel on the screen takes all relevant light sources into account. Ensuring that all the reflections and refractions are correctly calculated even if the light is reflected off several surfaces. The image could be no more faithful if you were filming real objects in real light. To produce such a superb animated sequence, however, was quite a difficult task – Until now.

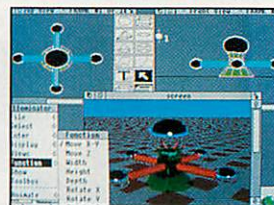
Illuminator has changed all that. It is a fully RISC OS graphical front end to Render Bender. Allowing the user to create a series of frames manually, or to give it a start point and an end point, leaving it to generate the frames in between. What you are getting is the ability to take a sneak

preview. You can see what you are going to get, before you get it. After you've created your outline frames in Illuminator, you then transfer the files to Render Bender, the fully RISC OS Ray Tracing part of the package. Which all means that now, to achieve powerful 3D Animation, you no longer have to be a mathematical genius. You just have to be the proud owner of Render Bender 2.

For more information please write to the address below for a Render Bender fact pack. We're sure you'll find it quite illuminating.

Price – £135.00 inc. Vat.

To upgrade from the original Render Bender to Render Bender 2 send us your original disc plus £74.95.



98 Middlewich Road, Rudheath, Northwich, CHESHIRE CW9 7DA. Telephone: 0606 48511 Fax No: 0606 48512



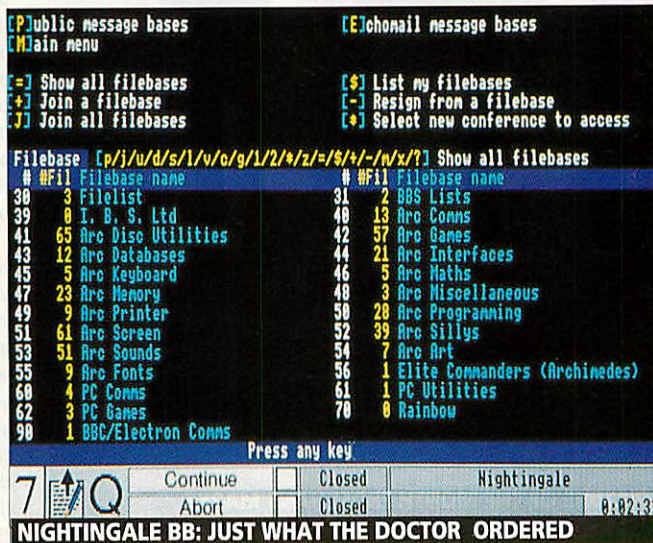
ODE TO A NEW NIGHTINGALE

THIS month's bulletin board is Nightingale BB, based in Bristol and run by Paul James. Paul is a qualified nurse and wanted to start Nightingale to cater for nursing and medical matters because he says, 'all the boards we tried to access, that claimed to be of this nature, did not seem to exist'.

So far Nightingale has been online for a couple of months and is rapidly building up its userbase. Certain areas are restricted to professionals in the medical field only and proof of qualifications and entry requirements are all explained on the board itself.

However, the board does not just cater for medical types but covers all subjects that may appeal to Archimedes and PC users. At the moment there are around 40Mb of PD and shareware programs available to download and this total is growing all the time.

There are also new areas appearing all the time. These include What's on in Bristol, Bath and South Yorkshire and



a section called Rainbow, which is run on behalf of people with disabilities. Nightingale has recently joined the extensive Fidonet network, so all the usual conference areas are also included.

Paul runs Nightingale from a 2Mb A3000 computer, armed with an Oak SCSI interface and 49Mb drive and

running *ArcBBS* software. He has a Racal-Milgo Maxam IV modem, capable of running at all speeds up to and including V42bis at MNP5. You can log on to Nightingale by setting your comms software to Ansi, 8N1 and dialling (0272) 535962, available 24 hours a day, every day of the year.

Paul Vigay

NEWS IN BRIEF

● **EVER** fancied learning more about comms and networks? If so, Learning Tree International run a host of comms courses, ranging from hands-on training days for beginners, to complete expert courses. Prices range from a few hundred pounds upwards, but discounts are available for companies who send more than one applicant. More details from Learning Tree International on free-phone (0800) 282353.

● **COMPUTER CONCEPT'S** long awaited fax podule is now available, priced at £200 plus VAT. More details in later columns, but phone Computer Concepts on (0442) 63933 for more details.

● **IT'S PLUG** time again and news has come to me of the first Archimedes BB to be run using an A5000 computer. Rich in Paradise BB is based in Paignton, Devon and offers support for all aspects of Acorn interest, including message areas and downloadable files. The sysop, Richard Paddle, also hopes to connect up to Fidonet in the very near future, so set your comms software to Ansi, 8N1 and give it a ring on (0803) 666808.

● **HOW** often do you call Directory Enquiries? At a cost of 40p each time, it can work out quite expensive. But if you are a Prestel subscriber, PhoneBase is still available on Prestel. All you need is a viewdata terminal and you can search the telephone directories at your leisure.

Costing between 6p and 13p a minute, it is far cheaper than calling Directory Enquiries – just supply a name and location and the computer will provide a cross-referenced list of matching entries. You can amend your choice or search for another entry. If you are not a Prestel subscriber call free phone (0800) 800878 for details on how to access PhoneBase.

To complement PhoneBase, BT also offer the entire UK Yellow Pages as an online system. Electronic Yellow Pages (EYP) are available 24 hours a day and can be accessed via Prestel or even called direct. There is no charge – all you pay is the local rate. A user guide and more info can be obtained by calling (0734) 506506 during office hours.

THE COMMS JARGON-BUSTING GUIDE

COMMS is perhaps the most jargon-littered subject in the world of computers and this amount of shorthand has probably served to shorten online conversations, saving money and time. However this hi-tech language has infiltrated the rest of the computing world and fallen upon the ears of unsuspecting computer users.

It forms a formidable barrier to comms beginners, no matter how computer literate they are. Abbreviations such as ACUG and CRC are commonplace – not to mention CCITT and CEPT. So to help you hack through the jargon jungle each month, I will explain a few such terms.

We begin with ACK – a truncated form of the word acknowledge. An ACK is a non-printing character used in some protocols to indicate that a block of data has been received successfully. On

receipt of an ACK, the program which is sending the data knows that it can send more.

An example of the complete redundancy of some comms terms is the following abbreviation: DCE means Data Circuit-terminating Equipment or in other words, a modulator demodulator, modem for short. Likewise, DTE or Data Terminal Equipment is known in ordinary circles as a computer.

The CCITT is the Consultatif International Telephonique et Telegraphique, an organisation which sets international comms standards such as V21, V22m X25 and so on. Another organisation to suffer from this merciless name cropping is CEPT – the European organisation for communications standards.

CEPT define a number of standards that are followed on a European basis, such as the CEPT Videotex standard,

which is used to define the differences between the British and French protocols.

Some words in the comms world sound quite harmless. For instance Duplex refers to the transmission of data in two directions simultaneously and EOB is the End Of Block, a non-printing character used in some protocols, usually in association with ACK.

Even you, the user don't escape from the vicious name shortening. An NUA is a Network User Address and is how a computer refers to you or, more accurately, your terminal. The similar sounding NUI, Network User Identity, is used in a PSS (public switched system) for dial-up access by each user, a telephone number in other words.

Well, that's it for this month, watch out for more jargon busting in next month's *BBC Acorn User*.

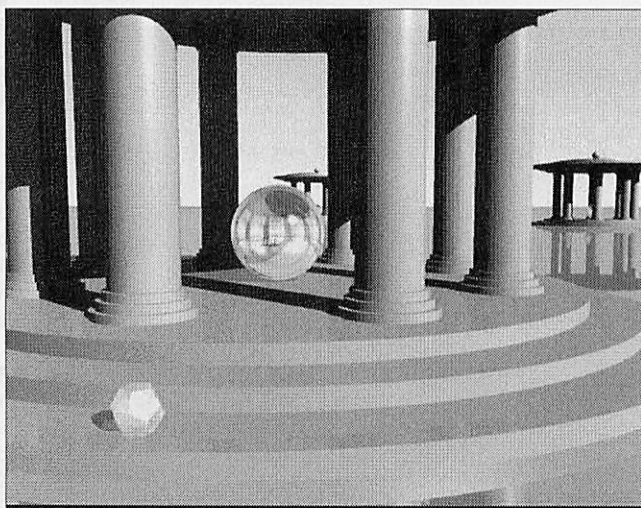


INSPIRATION ON THE ARCHIMEDES

QUITE a few submissions are coming in for our monthly graphics gallery, although at present, there's been nothing from any eight-bit machines. Now we *know* that there are thousands of budding, or budding artists out there with eight-bit machines, so come on you lot – get cracking!

The standard of pictures for the Archimedes is excellent. This month's picture is called *Stone* and is by Hans Marks of Holland. There is an equally impressive picture from Hans on the subscribers' disc, called *Chain*. Both were created using his own software.

Rob Miller



THE PICTURE OF THE MONTH FROM HANS MARKS

PLANS TO REVAMP CHAMELEON

4MATION are to upgrade their *Draw* file, colour rendering program *Chameleon*. The authors of *Chameleon* thought that it was a little overshadowed by *smArt*, which was released by 4Mation at the same time, and have now decided to revamp it.

Chameleon 2 will have all the facilities of the original program, with a few extras. Fills will make up a large proportion of *Chameleon's* tools and will include straight, circular and fountain fills. All will be fully definable by the

user, utilising the full 24-bit format that *Draw* files allow.

The software should be ready sometime in the Spring. Although the price has not yet been fixed, it is expected to be slightly higher than that of the original program, to reflect the extra additions. A cheaper upgrade price will of course be available for all registered users of *Chameleon*.

Further details on the upgrade can be obtained by contacting 4Mation, 14 Castle Park Road, Barnstaple, Devon, EX32 8PA. Tel: (0271) 25353.

THE 'POCKET-SIZED' PICTURE

JUST when you thought it was safe to compress all your picture files, along comes another format, promising even greater compression. A new compression standard called JPEG (Joint Photographic Experts Group) standard, is designed for compressing high resolution colour images.

It works by removing 'unwanted' information from a picture. Because of the high resolution of pictures being compressed, it is possible to fool the eye by only retaining information to which the eye is sensitive. Decompressing a picture is quite a complex process and is carried out successfully until the user is happy

with the result. Due to the nature of the algorithm, decompression can take some time, although there is some dedicated hardware available to speed up the process.

Irlam Instruments Ltd are implementing the JPEG standard into all their software and hope other software/hardware vendors for the Archimedes do likewise. It's no secret that Acorn will eventually support 24-bit colour in hardware and they are also looking at ways of implementing the JPEG standard in relation to 32-bit technology. Contact Irlam Instruments, 133 London Rd, Staines, Middlesex. Tel: (0895) 811401.

SPEEDGRAPH

EVOLUTION Computer Ltd, a company new to the Acorn market, have just announced the *SpeedGraph* expansion card. It offers two major improvements on the Arc's graphics capabilities.

Firstly, *SpeedGraph* will increase the possible resolution to 800x600, with 256 colours, and 1024x768, with 16 colours. Unlike the VIDC enhancers currently available, *SpeedGraph* will have no effect on the speed of the computer when using larger screen sizes: in fact *SpeedGraph* will have the bonus of speeding the Arc up at normal resolution modes. The new modes also have a high refresh rate, 72 and 60Hz respectively.

Housed in an external box, *SpeedGraph* requires no podule space. As more and more podules become available from different hardware vendors, this comes as quite a boon. It will work across the full range of Acorn's 32-bit machines from the Archimedes 310 up to the new A5000. *SpeedGraph* requires a Multisync or VGA monitor to function and costs approx. £280. For further information, contact Evolution Computer Ltd, Portland Buildings, Portland Road, Aldridge, West Midlands, WS9 8PP. Tel: (0922) 55827.

NEWS IN BRIEF

● **AS** a seasoned user of graphics packages, I often have cause to think about what an ideal art package would contain in the way of tools, how it might operate and so on. I'm sure there are plenty of users out there who have a favourite program which would be the best thing since sliced bread, if only it allowed you to?

Revelation 2 is getting close to the mark, but it is still lacking in various areas. It has no real grid system for example. My favourite package at the moment is *Arcol*, which is soon to be upgraded. If you have any favourite art packages but know what would make them better, please write in with details and I'll try to put together a list of general likes and dislikes. If there are any companies out there who plan to revamp existing packages or write new ones, perhaps you could take note of what users really want.

● **THE** writers of 4Mation's *Poster*, are hard at work on its successor. There are no in-depth details yet, although the new product will be almost unrecognisable when compared to the original. Everything that is in *Poster* will be in the new program, plus an extensive range of drawing tools. The product is, however, quite a way off, and probably won't make an appearance until the end of the year.

● **CABLENEWS** is a new presentation graphics system for any Archimedes or A3000/A5000 computer. It is designed primarily for situations where you may require a slide show type display, such as point of sale promotions, or exhibitions. Acorn have in fact used it extensively for demonstrating their own products. *Lingenuity*, the producers of *CableNews*, can be contacted at: Wood Farm, Linstead Magna, Halesworth, Suffolk. Tel: (0986) 85477

● **ACORN** Replay was launched at the Bett show this year. It is a system that can read highly compressed video and audio data from a mass storage device and display it on the screen as a live video image. This is possible because of the implementation of a technique which removes redundant data between successive frames. Contact Acorn on (0223) 254200

Why don't you clean up your act?



With the HCCS HardCard!



The HCCS HardCard45 and HardCard100 can help to transform your computer (and your desk) into a professional tool with a large amount of hard disc based on-line storage. All those applications on floppy you need, and had to look for, can be at your fingertips in seconds. The HardCard consists of the tried and trusted HCCS SCSI technology together with a slimline hard disc drive and a fan in a case similar to a podule expansion case. The HardCard45 gives 45Mb of storage after formatting with an access time of 25mS. The HardCard100 gives 100Mb after formatting and an access time of 9mS. The HardCards are only available for the Acorn BBC A3000.



HardCard45 £349.00 ex VAT carriage FREE

HardCard100 £699.00 ex VAT carriage FREE.E&OE

HCCS Associates Ltd, 575-583 Durham Road Gateshead Tyne & Wear Tel (091) 487 0760 Fax (091) 491 0431

NEXT MONTH

BBC
ACORN USER

DECADE OF THE BBC MICRO

It is 10 years since the BBC computer literacy project led to a series of TV programmes which launched the BBC micro, and thus home computing in the UK. We preview a special programme looking back over this exciting decade, and look ahead

ARTWORKS

Computer Concept's new package could be described as the state-of-the-art on the Archimedes. We give you an exclusive preview of its capabilities

A5000 MEMORY BOARDS

No sooner has the new A5000 been launched than a range of memory upgrades come out. We check the boards available

Watch out for the April issue of
BAU – available March 12 1992

PLUS

PODULE EXPANSION

We look at the Pres podule expansion, designed to get the most out of your A3000

DIGITISER FOR UNDER £50

A new range of black and white digitisers from HCCS offer a low cost way of importing video images into other applications. We take a look

ARC ASSEMBLER

Dave Lawrence continues his series dedicated to the budding Arm programmer

REGULARS

- All the latest news and views from the world of Acorn
- ★INFO – helpful advice and ideas covering the BBC A3000, Archimedes, BBC B and Master
- Your letters and problems
- Programs galore on the yellow pages and much more

To be sure of your copy, please fill in the coupon below and hand it to your newsagent. Or why not take out a subscription, which includes a free monthly disc? See page 29 for details

DEAR NEWSAGENT, PLEASE ORDER MY REGULAR COPY OF BBC ACORN USER

YOUR NAME _____

ADDRESS _____

BBC Acorn User is published by Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. Distributed by BBC Frontline, Park House, 117 Park Road, Peterborough

The Complete Upgrade Solution



**Qualified
Dealer**

8Mb Memory

- Uses only eight RAM devices
- Suitable for A440, A400/1 & R140
- Fully RISC OS compatible
- Four layer printed circuit boards
- Courier collection & fitting included

8 Mb upgrade - £499

410/1 Memory

- 400 series RAM upgrade kits
- Supplied with full fitting instructions
- 410/1 to 420/1 requires 1Mb
- 420/1 to 440/1 requires 2Mb
- 410/1 to 440/1 requires 3Mb

1Mb - £35 2Mb - £64 3Mb - £98

A310 Memory

- Includes free MEMC1a upgrade
- Four layer printed circuit boards
- Courier collection & fitting included
- Free MEMC1a while stocks last

**2nd Mb - £99 4th Mb - £199
2nd to 4th Mb upgrade - £115**

A3000 Memory

- Uses only eight RAM devices
- User upgradeable from 1 to 4 Mb
- Four layer printed circuit board
- Low power consumption
- Available without RAM devices

Bare card - £35

2nd Mb Card - £56 4th Mb Card - £159

A540 Memory cards

- Uses only eight RAM devices
- Four layer printed circuit board
- Three cards may be fitted giving a total of 16Mb of memory

A540 4Mb upgrade - £275

Two memory cards - £520

Three memory cards - £749

ARM3 Upgrades

- 3 to 4 times performance increase
- Surface mount technology
- Four layer printed circuit board
- Suitable for all ARM2 based machines

25MHz ARM 3 upgrade - £199

Collection delivery and installation on all machines - £35

A5000 Memory & Drives

- Increases A5000 memory to 4Mb
- Upgradeable from 4 Mb to 8Mb
- 4Mb to 8Mb price includes installation
- High quality Four layer circuit board
- No special tools required

A5000 4Mb RAM - £110 4Mb to 8Mb RAM - £399

A5000 2nd 105Mb IDE drive - £299

VIDC Enhancers

- Increases resolution with all Multiscan monitors
- Doubles desktop work area
- Custom modes for Taxan and Eizo monitors
- Includes Mode designer software
- Free with any multiscan monitor from Atomwide

VIDC Enhancer - £25 A540 mode software £5

Syquest removable disk systems

- Including One cartridge, drive unit and all cables
- 42Mb removable cartridges
- High-flow fan fitted for improved cooling

Atomwide Syquest drive unit - £425

Drive unit with Oak SCSI card - £599

Spare 42Mb disks - £55

Quantum SCSI Hard disc's

- Including drive, metalwork and all cables
- Fast 16ms access 64K cache
- slim line disc two drives may be fitted in one frame
- Available as internal or external units

52Mb internal - £199 105Mb internal - £299

210Mb internal - £599 425Mb internal - £949

Oak 16bit card - £175 External unit add - £75

DTP & Monitors

- Impression II DTP package **£130**
- Impression junior DTP package **£70**
- LBP4 printer including sheet feeder **£1045**
- Eizo 9060 **£399** - Eizo 9070 **£599** - Eizo T560i **£1025**
- Taxan 795 **£490** - Taxan 875 **£775**

All monitors come with a Free VIDC enhancer

Carriage on all monitors is £7

Acorn Machines

A5000 & A5000LC - Free 4Mb upgrade

A540 - Free 4Mb ram card giving 8Mb

A3000 & A3000LC - Free 2nd Mb RAM

A5000 - £1499 A5000LC - £1531

With Eizo 9070 monitor A5000 - £1699 A5000LC £1731

A3000 - £599 A3000LC - £642 A540 - £2495



- All products are cross-compatible
- Combination deals available on all products
- Dealer enquires welcome
- Phone for full details on all products

All prices exclude VAT at 17.5% but include delivery with the exception of monitors

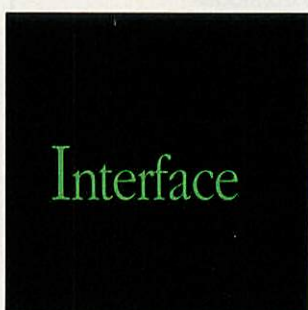
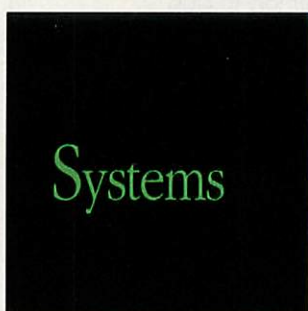
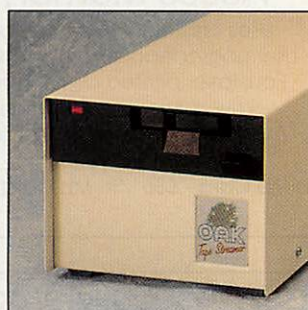
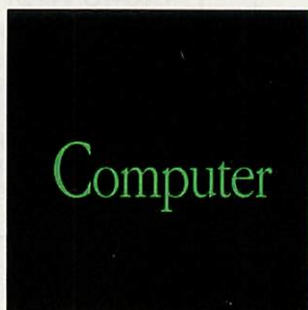
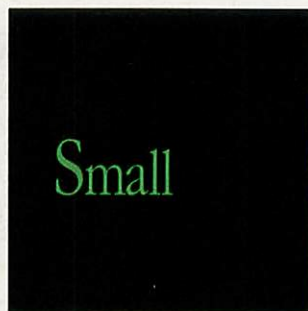
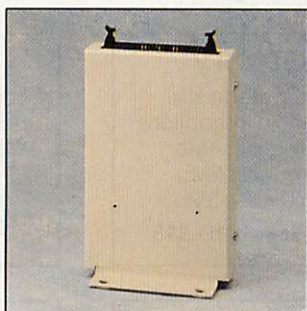
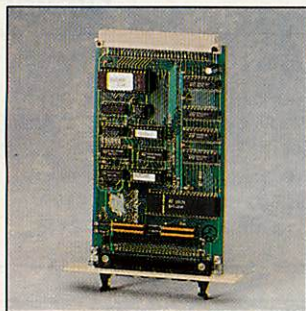


ATOMWIDE

23 The Greenway Orpington Kent BR5 2AY Tel 0689 838852 Fax 0689 896088



If it's got to work...



...it's got to be one of ours

Each hard disc comes complete with the following FREE software:
Euclid, Disc Tree, RISC OS Companion, Remote Logon, Worra Battle

Oak Solutions Suite 25 Robin Enterprise Centre Leeds Road
Idle West Riding of Yorkshire BD10 9TE
Tel: 0274 620423 Fax: 0274 620419

QUALITY

RELIABILITY

NEW LOW SCSI PRICES

16-bit SCSI Interfaces

A3000	£98.00
A300/400/500/5000	£98.00

Worra Winnie Internal Hard Discs A300/400/500/5000

50 Mb	£299.00
100 Mb	£449.00
200 Mb	£735.00

Worra Winnie External Hard Discs

A3000/A300/400/500/5000

50 Mb	£345.00
100 Mb	£495.00
200 Mb	£780.00

High Speed Internal Hard Discs A300/400/500/5000

50 Mb	£339.00
100 Mb	£489.00
200 Mb	£775.00

High Speed External Hard Discs A3000/300/400/500/5000

50 Mb	£389.00
100 Mb	£539.00
200 Mb	£825.00

Elite External Hard Discs A3000/300/400/500/5000

50 Mb	£489.00
100 Mb	£639.00
200 Mb	£925.00
300 Mb	£1345.00
680 Mb	£1795.00

Worra Tape Streamer

60 Mb	£595.00
150 Mb	£795.00

High Speed Tape Streamer

60 Mb	£765.00
150 Mb	£895.00

Elite Tape Streamer (DAT)

1 Gb	£1750.00
------	----------

Magneto Optical R/W Drive

560 Mb	£3650.00
--------	----------

Prices shown include SCSI interface.

Always state computer type when ordering

Prices exclude £10.00 p&p

and VAT



Telephone for
Education Prices

(and we'll knock off the cost of your call!)

Oak Solutions SCSI

First for Quality First for Performance and now First for Price too!

When we launched the Oak 16 Bit SCSI card and a range of hard disc drives in 1989, they quickly became the market leader. As with all our products, they were manufactured under a 'Zero Defect' quality control regime and enjoyed an enviable reputation for both quality and reliability.

Now we have turned our attention to the COST of our products so that they continue to be the best all round value for money. Our new pricing structure has been made possible by our bulk buying power and our recent move to much larger premises to keep pace with the demand for all our SCSI products.

Not only have we addressed the question of price but we have taken steps to enhance our reputation for quality and reliability by introducing the Quantum hard disc mechanism and the low noise Papst fan into our low cost Worra Winnie Range of hard disc drives.

With several newcomers to the hard disc marketplace, the issue of performance has become a little clouded of late, so to set things straight, we offer the assurance that size for size, you cannot buy a faster hard disc drive system from any other manufacturer.

Oak SCSI software is Acorn compatible, and allows hard discs to be partitioned into several logical partitions, which may be write protected if required. This feature can prove invaluable in the classroom situation where applications can be stored on a write protected partition - safe from accidental or malicious tinkering - whilst still allowing a read/write partition for data and scrap files.

Every Oak Solutions hard disc comes complete with over £250 worth of FREE software: the original Genesis hypermedia software, Disc Tree hard disc management software which allows easy backup of your drive to floppy disc, Euclid, the de facto standard for Archimedes 3D software, RISC OS Companion, Remote Logon, and the addictive Worra Battle tank game.

For professional security of data under RISC OS, our tape systems provide an unrivalled solution to your backup problems for any type of hard disc or network file server.

All our tape backup systems include !OakTape, a comprehensive and widely acclaimed RISC OS backup software program. Backups are done on a file by file basis with versatile control over backup criteria. Automatic backups may be triggered at pre-determined times, and printouts of tape contents can be automatically generated. Restoring from tape is simple and intuitive. Files and directories can simply be dragged from a tree viewer or directory viewers, either to disc, network or even directly into an application!

This advertisement could not hope to mention in detail all the SCSI products we manufacture, so for further details please write or telephone.



COMPATIBILITY

PERFORMANCE



STAR LETTER £15

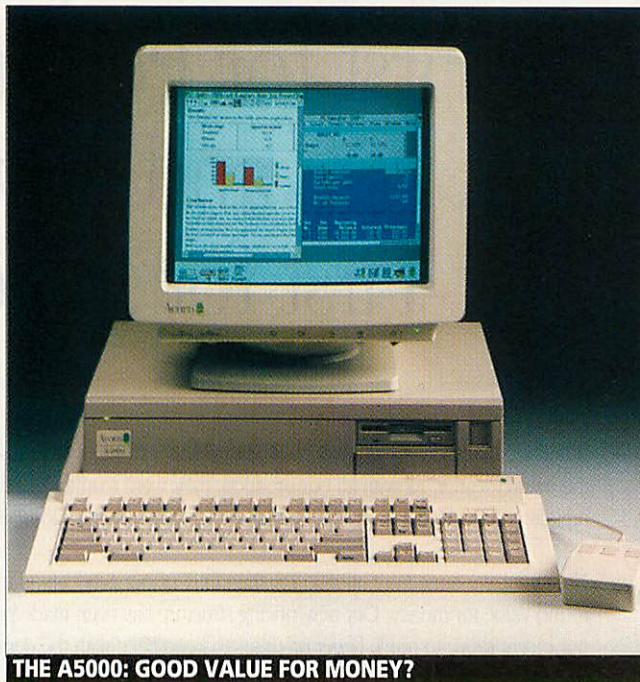
I read with interest the letter in your magazine from a gentleman claiming that an IBM clone may be seen as better value for money than the new A5000. He makes some interesting points, but he also omits a few relevant facts.

I was in a similar situation, contemplating whether to buy a 486SX or the A5000. I eventually chose the Acorn, and can honestly say that I am very pleased. Although I could have bought a 486 for less than an A5000 learning curve package, when I started to price things up on a straight value for money basis, the Acorn package came out on top.

I needed a word processor, a DTP package, a drawing package and a GUI (Graphical User Interface). The *Genesis* and *Paint* applications have all proved useful, as have the extras, such as bundled games, and of course Risc OS 3, which I am delighted with. In addition, I also used Acorn's interest free credit scheme which saved me a further few hundred pounds. And I do not need to pay our for a sound card. All in all I estimated a saving of between six and eight hundred pounds.

The other great inducements to go to Acorn were that one is not overcharged for GUI software. Have you seen the price for windows-compatible packages? For the purpose I bought the machine for - Cad - I now have *WorraCAD* from Oak Solutions and it does all I want it to do for a song. Try buying a GUI PC Cad package for less than £300.

On a different subject, you were looking for comments on applications that run under the PC Emulator? I have just tried



THE A5000: GOOD VALUE FOR MONEY?

Autoroute and if you configure the screen correctly, it runs perfectly, even if it does make me glad that I chose Acorn.

A G Weyman
Harrow Weald
Middlesex

This is just one of the responses we received supporting the cost-effectiveness of Acorn machines.

QUACK QUACK OOPS!

With reference to John Fairweather's letter in *BBC Acorn User* February 92, about connecting two disc drives to his BBC. I must say that I was very surprised that you didn't suggest the Data Duck which is available from Watford Electronics. I have used a Data Duck for the past three years, and I am pleased to say that it does away with the necessity to mess around with the 'internals' of a drive.

The duck consists of a ribbon cable, with a female

connector at one end to the disc drive port and two male connectors the other end, into which you plug into the two disc drive cables. Once connected the disc drive at the end of the duck automatically becomes drive one. Watford also produce a Power Duck which is necessary if one has two separate disc drives without PSU's (Power Supply Units). This device connects to the disc power socket under the left hand side of the BBC and works in the same way as the Data Duck. If one of Mr Fairweather's disc drives has a PSU then there is no need for the Power Duck.

Alan Brown
Workington
Cumbria

NETWORK NICETY

We so often read in your columns of Acorn's efforts that I wanted to publicise the following. Several years ago I purchased a network system for our BBCs from SJ Research of Cambridge. We recently had a problem with part of the system. Instead of taking the 'Oh your equipment is out of date... buy some new stuff' attitude of some firms, SJ worked hard with me to get our old system working.

Through some generosity on their part, I once again have a working system at very little

cost to our college. Not all firms exercise their right to apply the 'fair wear and tear' exclusion in their warranties, or indeed the time limitation. The problem might have been said to be beyond SJ's control, but they had sold the system, and stood behind it.

Tom Boyd
Seaford College
Petworth

COLOUR CONFUSION

Regarding your recent review of colour scanners for the Archimedes, there are a couple of points I wish to make.

Firstly the review incorrectly stated that *ChangeFSI* and *Translator* are bundled with the package. This is not so, although purchasers are encouraged to obtain them from PD libraries or other such sources. Secondly the DT software package will produce sprites files as well as clear files; selecting four, or fewer bits per pixel results in a sprite being produced (and a doubling of scanning speed) as a sprite can provide a reasonable representation of that number of colours or greys.

David Knell
DT Software
Cambridge

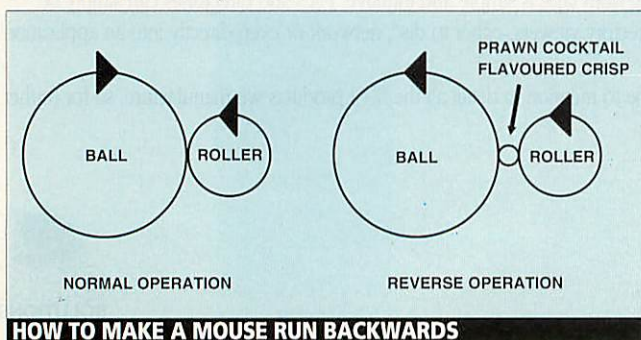
RE: TRACTION

The star letter in *BAU* Jan 92 mentioned a mouse problem. Another one I have found is that the pointer sometimes moves backwards for a short distance. The picture below shows how this can happen.

The piece of dirt acts as an idler between the ball and the roller, reversing the direction of rotation. The worst sort of dirt comes from using an india rubber, it seems to cling to the ball. Taking the ball out and cleaning it is the remedy, but prevention is better.

E W Ayers
Nacton
Ipswich

A good mouse mat is also important if your mouse is to run smoothly. Here in the Acorn User office the general consensus is that foam mats are the best, although there is the other school of thought that considers a good old cutting mat to be superior.



IT PAYS TO READ THE SMALL PRINT.

Where else can you buy hard disc systems for these prices?

Each system includes a high quality hard disc drive and a leading SCSI board (the Oak Solutions super fast 16 bit card).

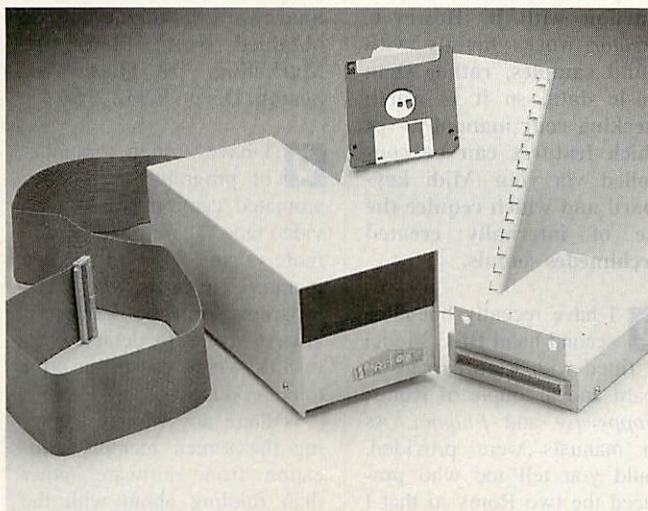
They come in colour designed to complement range of computers. And mode power supply,

Send us the picture below showing the new Warehouse Drive with OAK SCSI card (worth £199) and we'll give you the OAK SCSI card FREE When you order one of our Hard Disc Drives.

matched metal cases, the Archimedes contain a switched low noise cooling fan

and are complete with all cables, ready to use straight away.

For peace of mind every Warehouse Drive is fully tested and we offer 12 months warranty and full money back guarantee.



Drive for A3000 shown
OAK SCSI Card is RISC OS 3.00 compatible

Please return completed order form to:
Warehouse, 68 Green Street, Great Gonerby, Grantham,
Lincs. NG31 8LE
Tel. /Fax. 0476 593110

Prices exclude carriage (£10.00) and VAT (17.5%)
A1

300/400 Series	Internal	External	A3000 External
20Mb.....	£199 <input type="checkbox"/>	£279 <input type="checkbox"/>	£279 <input type="checkbox"/>
45Mb.....	£245 <input type="checkbox"/>	£325 <input type="checkbox"/>	£325 <input type="checkbox"/>
80Mb.....	£345 <input type="checkbox"/>	£425 <input type="checkbox"/>	£425 <input type="checkbox"/>

Please tick drive required

I enclose cheque /P.O. for £..... made payable to Warehouse

Please debit my VISA ☐ ACCESS ☐ Expiry date

Credit card number

Signature Date.....

Mr/Mrs/Miss/Ms Name

Address

.....

..... Postcode.....



Where else



QUESTIONS AND ANSWERS

Q Upon receipt of the December monthly disc my son wanted to gain access to the free screens supplied in CFS format. But after loading *CFSReader* and clicking on the CFS drive icon on the icon bar, an error was generated – CFS has no temp directory. After going through the *Readme* file we were still unable to get a display. Please can you help?

RE Mealar
Wirral

A The reason you are experiencing this problem is that *CFSReader* needs a small workspace on disc where it can decompress files. It is up to you to tell it whereabouts it can carry out this operation.

This can typically be inside your *System* folder, or in the root directory of the current filing system. The temp directory is set by pressing menu over the CFS icon, and moving over Temp Dir. Then you can simply drag the CFS icon to a directory viewer.

There was a slight problem with one of the screen shots on the disc, in that it was too big to decompress on the current floppy. It is best to move the CFS reader and the CFS files on to a blank floppy before decompressing.

Q I have an Archimedes with 4Mb of memory and a hard disc. I often use *Pipedream* for my accounts, utilising the Archimedes outline font manager. Although I allocate a large amount of memory (1024K) to fonts, the output using *PrinterDM*, still takes almost 10 minutes per page to print out. Is there any way I can improve this speed?

A.B.E. Ellis
Chelmsford

A Unfortunately, although increasing the font cache size will dramatically reduce the time it takes for the Archimedes to cache different fonts, the main cause of delay when using *PrinterDM* is the time it takes to send the data to the printer.

This is restricted by the speed of the hardware in the printer so it can't really be improved upon. However a



printer buffer will allow the Archimedes to send more data to the printer at any time, thus freeing the computer quickly so you can get on with other tasks.

You should find that most PD libraries advertised in the pages of *BAU* will be able to supply a printer driver module that you can load in.

Q Please could you tell me if I can connect my Yamaha Portasound-PSS680 to my A3000? If so, will I be able to use it with *Creator*.

Chris Muscat
Swieqi

A With the addition of a Midi podule you should have no problems. This will allow you to connect any Midi-equipped musical keyboard to your Archimedes. Acorn supplies a combined Midi and User Port expansion card for the A3000, priced at £49 plus VAT. In addition, you will require suitable five pin Din leads to connect your keyboard to the

computer. If *Creator* caters for a Midi input then there is no reason why you cannot use your keyboard in conjunction with it. However, *Creator* works mainly with sound samples, rather than music data, so it is worth checking your manual to see which features can be controlled via your Midi keyboard and which require the use of internally created Archimedes sounds.

Q I have recently bought a second hand BBC Model B, fitted with Rom expansion board and a couple of Roms; *Floppywise* and *Enigma*. As no manuals were provided, could you tell me who produced the two Roms so that I may obtain details.

R. Thomas
Swansea

A The *Floppywise* Rom was produced by Software Services in Liverpool, but unfortunately they are no longer trading and have no stocks left. *Enigma* was

produced by Altra Computers of Leeds, who can still be contacted on (0532) 484961. However, *Enigma* is also no longer available. Your best bet is probably to hunt around local dealers to see if anyone has old stock.

Sometimes the All Formats Computer Fairs in London, and now around the country, are a good source of discontinued BBC Software. Also it is well worth keeping an eye on our free ads pages.

Q As a Christian minister, it would be of great help to have the Bible on hard disc for the Archimedes. I have seen PC versions around but using them under the PC emulator is slow and it also consumes valuable memory space. Does anyone know if a Risc OS version exists or where the texts can be obtained?

Philip Foster
Cambridge

A As you say, there are a number of PC versions available, including the range of Shareware programs. However, one PC Shareware library can supply the entire text of the King James version as plain Ascii files. You can incorporate the text into your own programs. A complete Shareware catalogue can be obtained from: Shareware Marketing, 3a Queen St, Seaton, Devon EX12 2NY

Q I have written a number of programs to produce animated captions for use on video tape. These often require more than 80K of screen memory. However, when I run programs from the desktop, it always seems to default back to 80K which causes an error to be produced.

Is there any way of changing the screen memory allocation from software rather than fiddling about with the task manager?

Ian Cummins
Paignton

A Yes, there is a short program, supplied on Applications disc two, which allows you to change various configuration options via simple star commands. It is

called *MemAlloc* and is located inside the *Lander* application. To use the program, make a copy of it inside your application and insert the following line into your *!Run* file;

```
RMEEnsure MemAlloc 0 RMLoad
<Obey$Dir>.MemAlloc
```

You can then add the following line: *ScreenSize 256k*. This extra line will dynamically alter the size of the configured option. Type in **HELP MEMALLOC* for details on what commands are supported. The default options will be restored whenever you quit your application and return to the desktop.

Q Please can you give me some advice about the joysticks available for my Archimedes. I read somewhere that I can get one that plugs straight into the serial port, but I don't have this upgrade fitted. Is there any way that I can add a joystick without the expense of these additional interfaces?

Ted Francis
Lancaster

A I haven't seen any joystick interfaces that use the serial port. However, you may have been confused by one advertised by a company called The Serial Port.

They produce a joystick that accepts standard Atari nine pin joysticks and plugs into the printer port. It has a switch so that you can leave your joysticks connected and still use the printer.

This particular model costs £24.95 and is available from The Serial Port, Units 11-14, White Hays North, West Wilts Trading Estate, Westbury, Wiltshire BA13 4JT, tel: (0243) 531194

Q Following the hype about the A5000 I nearly bought one, and some upgrades to graduate from a Turbo Master. But fortunately, I stopped just in time when I found out that there is no hardware option to connect an external 5.25in drive, as on the A3000 and A400 series. I would not have been able to extract data from my existing collection of 5.25in discs, or

use the special programs I have written over the years. Nor would I be able to write programs for my son and grandson, who still have eight-bit machines and 5.25in drives.

Of course some clever bod is going to suggest buying a dual 3.5in drive and transferring the data via this, but the drive would be redundant after getting rid of the Master. I bet some schools will have second thoughts when they realise the limitations of the machine.

E A Allchin
Bridgewater

A Actually you can add an external 5.25in drive in exactly the same way as with the A3000, 300/400 series, by adding a disc buffer. A new type of interface is needed but Risc Developments is currently working on one and the company says it should be ready by the mid-February, with an expected price of around £30.

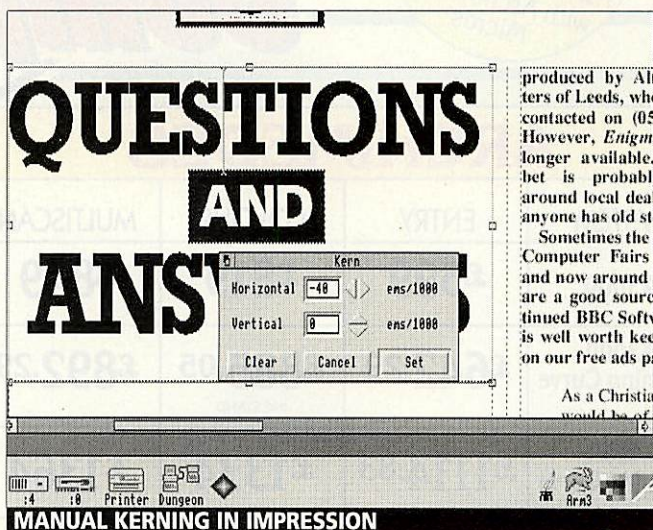
Q I am considering investing in an Acorn A5000 for DTP purposes and wonder if you can help me with a few questions. Firstly, are there any companies who can produce professional bromide PMT's or film from Archimedes format discs?

I also need to know how the Archimedes handles kerning, the distance between characters. For example the distance between AB is usually greater than that of AT - can this be done automatically or do I have to alter it manually? Finally I would like to be able to design fonts: are there any programs available?

Simon Richardson
London

A A number of printing companies are becoming increasingly aware of the Archimedes DTP capability. Try having a word with your local printers to see if they have access to an Archimedes. Alternatively, you can output a postscript file on to an MS-Dos format disc (as described in previous columns) and give them that disc instead.

This file then drives the Linotronic machine to create



the bromide or film. To do this effectively you will need to obtain the *Impression* Business supplement which will include the *Expression* application. This can ensure that all of your font names match correctly, and that the full resolution of the lithographic printer is utilised. Take a look at our Software Showcase for companies that have facilities to output film from PostScript files.

Most DTP packages, such as Acorn *DTP* and *Impression* by Computer Concepts, will allow you to adjust the kerning manually to suit your own requirements, although at present there are no DTP packages for the Arc with kerning tables, like those in *Quark* on the Mac.

As for your last point, there is a piece of software available, written by Acorn for designing fonts, although it is quite an intricate task. It

is called *FontEdit* and your local dealer should be able to obtain a copy for you. Alternatively, you can try contacting the Acorn Customer Services Department on (0223) 245200.

Q I have many fonts, and this causes problems with some applications, particularly *Edit*, which crashes. Is there any way of preventing this?

Polly Gordon
Clapham

A Well, fortunately we have just received the following tip from Mr Haslam in Lancashire which can remove the fonts while *Edit* is run. Remove Run <Edit\$Dir>.!RunImage %*0 from the *Edit !Run* file and replace it with the lines;

```
Set Font$Temp <Font$Path>
Unset Font$Path
Desktop<Edit$Dir>.!runimage %*0
Set Font$Path <Font$Temp>
Unset Font$Temp
```

HELP US TO HELP YOU

The Questions and Answers page is your chance to have your problems solved. It can be on any topic - you name it and we'll try to solve it. Please send your questions, whether technical or otherwise, to:

Questions and Answers
BBC Acorn User
20-26 Brunswick Place
London, N1 6DJ.

We are happy to answer your queries on these pages, but regret that we are unable to send personal replies to questions sent in. If you send a disc, please put your name and address on the disc itself. It is also useful if you could include full details of your machine. Please enclose an SAE where necessary and mark on your envelope whether you use a BBC eight-bit micro or 32-bit Acorn A3000/A5000/Archimedes/A5000.

**FREE
1 YEAR'S
ON-SITE
MAINTENANCE**
with Archimedes
Micros

College Computers

**FREE
DELIVERY**
on all
Archimedes
Micros

ARCHIMEDES

SYSTEM	ENTRY	COLOUR	MULTISCAN
A3000	£599	£819	£849
A3000 Learning Curve	£642.29	£885.05 <small>INC STAND</small>	£892.29
A420/1 Learning Curve	£1114.83	£1334	£1364
A540/1	£2495	£2715	£2745

SYSTEM	ENTRY	COLOUR	MULTISCAN
A5000 1Mb RAM floppy drive	£999	£1219	£1249
A5000 2Mb RAM 40Mb HD	—	—	£1499
A5000 Learning Curve	—	—	£1531.06
A5000 Learning Curve and Printer	—	—	£1765.96

A3000 ACCESSORIES

3.5" External Drive	£97
Monitor Stand	£15
External Podule Case	£12
Serial Upgrade	£16
A3000 Technical Manual	£28
Dust Cover Micro/Monitor	£5
Dust Cover Micro	£9
User Port/Midi Upgrade	£44
UHF TV Modulator	£29

RAM UPGRADES FOR ARCHIMEDES

A3000	Upgrade to 2Mb RAM	£49
A3000	Upgrade to 4Mb RAM	£164
A305	Upgrade to 1Mb RAM	£48
A305/A310	Upgrade to 2Mb RAM	£229
A305/A310	Upgrade to 4Mb RAM	£419
A410/1	Upgrade to 2Mb RAM	£37
A410/1	Upgrade to 4Mb RAM	£99
A410/1	Upgrade to 8Mb RAM	£725
A420/1	Upgrade to 4Mb RAM	£72
A420/1	Upgrade to 8Mb RAM	£679
A440/1	Upgrade to 8Mb RAM	£569
R140	Upgrade to 8Mb RAM	£569

CONCEPT KEYBOARDS

A4 Standard Keyboard inc BBC Software	£115
A3 Standard Keyboard inc BBC Software	£140
A4 Archimedes Keyboard	£116
A3 Archimedes Keyboard	£141

PLOTTERS

ROLAND		SKETCHMATE	£320
DXY-1100	£494	GRX-300	£2560
DXY-1200	£625	GRX-400	£3425
DXY-1300	£829	DPX & GRX Include	
DPX-2500	£2348	12 months on-site	
DPX-3500	£2960	maintenance	

ARCHIMEDES ACCESSORIES

NEW Multitasking RISC OS	£28
3.5" 800K 2nd Floppy Drive (305/310)	£109
5.25" 800K External Floppy Drive	£84
I/O Podule	
(Analogue & User Port & 1MHz Bus)	£75
MIDI add-on to I/O Podule	£27
MIDI Expansion Card	£64
Econet Network Board	£43
IEEE Interface Adaptor	£265
16 Bit Parallel I/O Card	£193
Software Developers Toolbox	£147
Floating Point Unit	£449
SCSI Adaptor Expansion Card	£159
Keyboard Extension Lead	£5
2 Podule Backplane	£24
4 Podule Backplane	£37

HARD DISK DRIVES (ST506)

20Mb for 410 ST506	£159
40Mb for 410 ST506	£235
53Mb for 410 ST506	£POA
A3000 20Mb + Podule	£335
A3000 40Mb + Podule	£449

SCSI HARD DRIVES FOR A400

Supplied complete with controller card.

52Mb Internal	£348
105Mb Internal	£549
170Mb Internal	£829
210Mb Internal	£899

COMMUNICATIONS

Amstrad SM2400 V22BIS	£120
Miracom WS4000	£98
Miracom WS3000 V22BIS	£230
Pace Linnett Plus	£97
Pace Linnett 1200 V22	£149
Pace Linnett 2400 V22BIS	£188
Pace Linnett 32	£364
Hearsay comms software	£48
BBC/Master Modem Cable	£14
Archimedes Modem Cable	£14

BBC MASTER SYSTEM

Acorn Master 128 Computer
Cumana CDX400 Dual Drive
Microvitec Colour Monitor
Two Tier Monitor Stand.

£679

BBC B and MASTER ACCESSORIES

Turbo 65C102 Add-on-Module	£113
Econet Module for Master	£44
Twin ROM Cartridge for Master	£12
Master Reference Manual I (No VAT)	£13
Master Reference Manual II (No VAT)	£13
Master Advanced Ref Manual (No VAT) P.O.A.	
64K Upgrade Kit for B+	£31
Acorn 1772 DFS Complete Kit	£47

MASTER 128 CUMANA DISC DRIVES

5.25" 200K Single 40T No PSU	£64
5.25" 200K Single 40T With PSU	£79
5.25" 400K Single 40/80	
Switchable No PSU	£79
5.25" 400K Single 40/80	
Switchable With PSU	£89
5.25" 400K Dual 40T No PSU	£125
5.25" 400K Dual 40T With PSU	£149
5.25" 800K Dual 40/80	
Switchable No PSU	£159
5.25" 800K Dual 40/80	
Switchable With PSU	£179
3.5" Single Drive No PSU	£64
3.5" Single Drive With PSU	£79
3.5" Dual Drive With PSU	£125
3.5" + 5.25" 40/80 Switchable	£169

College Computers

ARCHIMEDES SOFTWARE

Artisan II	£9
Atelier	£6
Autosketch II	£6
Gamma Plot	£3
Graph Box	£5
Mogul	£1
Poster	£7
Pro Artisan	£7
Render Bender 2	£9
Sigma Plot	£3

AlphaBase	£3
Genesis	£6
Multistore	£19

Acorn DeskTop Publisher	£129.95
Impression Junior	£79.95
Impression II	£139.95
Tempest	£99.95

Desktop Office	£9
Logistix	£7
Pipedream 3	£11

ANSI C Rel 3	£122
Assembler	£145
Fortran 77	£75
ISO-PASCAL	£75
LISP	£145
Prolog X	£145

Arc PCB Professional	£269
Gerber Plot	£91
Realtime Solids Modeller	£132
Risc Basic	£72
Robo Logo	£52
Solid Cad	£115
Solid Render	£115
Solid Tools	£269
Super Dump	£19
Super Plot	£28

Intersheet	£23
Schema	£90
Sigmasheet	£38
Viewsheet	£44

1st Word Plus II	£68
Easiword	£29
Interword	£23
Pendown Archi	£47
View	£44

FREE Parallel Printer Cable With All Lasers

All printers marked by an * include 12 months on-site maintenance.

MONITORS

14" Multiscan Hi-Resolution 0.28 Dot Pitch, 1024 x 768 **£239**

1431 Standard Resolution	£1655
1451 Medium Resolution	£1999
14M325 (CUB 3000) Medium Res.	£1675
1441 High Resolution	£3499
2040CS 20" High Resolution	£6599
Touchtec 501 Touch Screen	£9349

BM7502 12" Hi-Res Green	£68
CM8833/II 14" Medium Res	£167

Multisync 3FG 15"	£368
-------------------	------

14" Multiscan £219

770LR 14" 0.31 Dot Pitch Low Rad **£365**

775 14" 0.28 Dot Pitch Hi-Res **£365**

795 Trinitron 0.26 Dot Pitch **£405**

875 17" 0.26 Dot Pitch	£689
VDC Enhancer Board	£24

VDC Enhancer Board £24

PRINTERS

FREE Parallel Printer Cable With All Printers

Printers with * inc 1 years on-site maintenance.

Hardware: £7.50 + VAT per box
Lasers: £15 + VAT per printer
Next Working Day/UK Offshore - call

ALL PRICES EXCLUDE VATCREDIT CARD MAIL ORDER HOTLINE

☎ 081-680 5686

FAX: 081-680 9412



**College
Computers**

Prices are subject to change without notice. Please check suitability with the manufacturers before ordering. Goods are not offered on a trial basis. Orders are accepted subject to our standard conditions of sale – available on request. E&OE.

Subject to availability despatch is normally effected within 2 days from receipt of cleared payment. Please allow 7 working days for cheque clearance. All orders will be fulfilled within 28 days unless otherwise notified.

**College Computers, 14 Emmabrook Court, Sea Road,
Rustington, Littlehampton, Sussex BN16 2NG**

To: **College Computers, 14 Emmabrook Court, Sea Road, Rustington, Littlehampton, Sussex BN16 2NG.** I wish to order

[illegible]

Name _____

New/Old customer (please delete). Account No. (if known) _____

Address _____

Postcode: _____ Tel No: _____

All 3

PRES

AT THE FOREFRONT OF A3000 UPGRADES

Monitor Stand

Probably the best monitor stand available for the A3000 and the sturdy basis of your modular system.

System Housing

When you are ready to expand the A3000 this system housing is placed over the monitor stand, allowing two floppy drives and hard drives to be added with ease.

Expansion Card Case

If you're adding an expansion card (or podule) to your A3000 then you will need this case to connect and protect it.

Podule Expansion System

Allows two podules to be added to your A3000, and be working alongside each other simultaneously.

Disc Buffer

The definitive expansion for people that wish to add extra floppy drives. Support for 40 and 80 tracks. Will also allow you to add SCSI. We are continuously working on other options.

65Host 1770 DFS and DFS Filer

A Rom upgrade for the Disc Buffer that provides a DFS drive icon on the icon bar and 1770 DFS in 65Host, the BBC Emulator.



OTHER QUALITY PRODUCTS FROM PRES

MICRO TRADER, PROFESSIONAL ACCOUNTS SYSTEM

A dedicated system for the serious business user and home user alike. Exploit the true power of the Arc with our multi-tasking professional accounts package. Call for your free demo disc.

TML - THE MISSING LINK

Fast data transfer between linked Archimedes. At 10 million bits per second.
£74.95 each

THE SPACE KIT

Allows 400 series owners to fit a second internal hard drive.
£32.95

NEW PRODUCT A3K4 DOUBLE PODULE EXPANSION

Now you can add a second standard eurocard podule to your A3000. Fully integrated with the PRES expansion system - no soldering required, no timing problems, no large box bolted around your computer, simply 'plug in and expand' ... (requires A3K3 expansion card case). Remember A3K6 also allows for an extra internal card; giving a total of ... 4 expansion cards in your A3000

PRES Ltd, Box 319, Lightwater, Surrey, GU18 5PW



Tel. 0276 72046 • Fax 0276 51427 ☎

PRES, ADDING EXPANSION OPTIONS

A 3.5-inch floppy disk and a 5.25-inch floppy disk, both labeled 'ACORN USER' with the BBC logo. The 3.5-inch disk is blue and the 5.25-inch disk is black. Both disks are shown at an angle, with the 3.5-inch disk in the foreground and the 5.25-inch disk behind it. The labels are white with the BBC logo in red and the text 'ACORN USER' in black.

**SUBSCRIBE
NOW AND
SAVE
POUNDS!!**

THE MONTHLY DISC

If you purchased each monthly disc separately, it would cost you up to £5.95 per disc. So, with a 12 month subscription to *BAU*, you could receive discs worth over £70 absolutely *FREE!*

COMPATIBILITY

The 5.25in disc is 40/80-track DFS and is suitable for use with BBC B/B+ and Master computers with a 5.25in, 40 or 80-track drive. So, no matter which Acorn machine you have, you can take advantage of this fabulous offer now.

WHAT DO I DO?

BAU Subscriptions, PO Box 66, Wetherby LS23 7HL.
Or ring the credit card hotline number: (0937) 842489

NB: offer applies to UK subscriptions only, for details of overseas subscriptions see order form on page 89



I would like to subscribe to *BBC Acorn User* for 12 months at the cost of £22.95 and receive my *FREE* monthly discs. (Discs are only sent from the beginning of a subscription period).

NAME.....SIGNATURE.....

ADDRESS.....

Disc size required (please tick) - ☐ 3.5in Renewal ☐
☐ 5.25in New Subscription ☐

☐ I enclose a cheque/PO made payable to Redwood Publishing Ltd.

☐ I wish to pay by Access/Visa

Card Number..... Expiry Date

Orion Computers

Acorn Key Dealer ☆ Component Level Service Centre

Network Dealer & Installer

Acorn Computers

BBC Master Series
Master 128K 395.74 465.00

BBC A3000 Series
A3000 1Mb Basic 595.74 700.00
A3000 Learning Curve 637.45 749.00
A3000 LC Colour System 850.21 999.00
(A3000 LC, AKF17 Monitor, Stand)
A3000 LC Col. + Printer Sys. 1085.21 1275.00
(as above plus Acorn JP150 Printer)
A3000 Special Access 676.50 795.00

Acorn A5000 Series
A5000 1Mb No Monitor 994.89 1169.00
A5000 2Mb + 40Mb HD 1497.87 1760.00
A5000 2Mb LC + 40Mb HD 1531.06 1799.00
A5000 2Mb LC + Printer 1765.96 2075.00
(as above plus Acorn JP150 Printer)
All A5000 2Mb models include an Acorn Multisync Monitor in the price.

Acorn A500 Series
Archimedes 540 2493.62 2930.00

Special Offer when purchased with computer!!
A3000 - £35.00 discount off other goods bought with computer, plus either:
2Mb Upgrade F.O.C. OR
4Mb for £115.00 inc VAT
A540 - Multi-Sync Monitor + Star LC20 F.O.C.
A5000 - 2Mb RAM Upgrade F.O.C.
These offers cannot be combined with any other offer.

We Operate the Acorn Educational Scheme.
We can supply Learning Curve Models on the Acorn 0% Finance Scheme.
Finance available over twelve months.
Deposit
Monthly
A3000 LC Colour System 99.00 75.00
A5000 2Mb LC 179.00 135.00
Finance Prices Shown above INCLUDE VAT

Monitors

Acorn Colour (AKF17) 200.00 235.00
Philips CM8833 II Colour 208.51 245.00
Microvitec CUB3000 Colour 200.00 235.00
Taxan MultiVision 775 388.94 457.00
(0.28 Dot Pitch)
Taxan MultiVision 795A 439.15 516.00
(0.26 Dot Pitch, FST Black Trinitron Anti-Glare Tube)
Items marked with * will work on A300/A540's

A400/1 Accessories

1Mb RAM Upgrade 38.30 45.00
2Mb RAM Upgrade 74.89 88.00
3Mb RAM Upgrade 104.68 123.00
(Above memory fitted for £10.00 plus courier charge)
Acorn SCSI Card 238.30* 280.00
Acorn Ethernet II Card 219.57* 258.00
Acorn MIDI Card 64.68* 76.00
Arm 3 Upgrade (Adelph One) 297.87 350.00
4Mb to 8Mb Upgrade 649.36 763.00
C.C. Scan-Light A4 369.36* 434.00
Sheet Feeder for above 148.94* 175.00
C.C. Scan-Light + Feeder 453.62* 533.00
C.C. Scan-Light Junior 165.11* 194.00
C.C. Scan-Light 256 199.15* 234.00
VIDC Enhancer 27.23 32.00
Econet Module 47.66* 56.00
Beebug Disc Buffer 34.04 40.00
Orion TV Modulator + Audio 41.70* 49.00
Replacement Floppy 45.96 54.00

A540 Accessories

4Mb Upgrade (Upto 16Mb) 378.72 445.00
VIDC Enhancer 10.00 11.75

A5000 Accessories

Acorn 2Mb Ram Upgrade 125.11 146.00
Orion 2Mb Ram Upgrade 97.87 115.00

A3000 Accessories

Orion 1 Mb RAM Upgrade 50.21 59.00
(Expandable to 4Mb using only 8 chips)
Orion 3 Mb RAM Upgrade 143.83 169.00
A3000 Module Expansion 55.32 65.00
Two slot external module expansion case allowing the use of two compatible 400 series cards simultaneously.
For example, the CC Laser Direct Card with an Orion IDE Interface.

Acorn Serial Upgrade 17.87 21.00
Orion Serial Upgrade 14.47 17.00
PRES Monitor Stand 24.68 29.00
Acorn User/Midi Port 46.81 55.00
CC Scanlight Junior A3000 165.11 194.00
CC Scanlight A4 Mk II A3000 369.36 434.00
CC Sheetfeeder for A4 Scan. 148.94 175.00
CC Scanlight A4 + feeder 453.62 533.00
CC Scanlight 256 199.15 234.00
Orion TV Modulator + Audio 41.70 49.00

Books/Manuals

Programmers Ref. Manuals 77.00 77.00
Prog. Ref. Man. (RiscOS 3) T.B.A. T.B.A.
BASIC V Guide 19.45 19.45
A3000 Technical Guide 28.95 28.95
A5000 Technical Guide 63.00 63.00
A540 Technical Guide 63.00 63.00
Basic V: A Dabhand Guide 9.95 9.95
Arc. First Steps 9.95 9.95
Arc. Assembly Language 14.95 14.95
Acorn D.T.P. Manual 10.00 10.00
1st Word Plus Release 2 10.00 10.00
ANSI C Release 3 20.00 20.00
Acorn Desktop C 25.00 25.00
Acorn Desktop Assembler 25.00 25.00

Printers

PLEASE NOTE

ALL our printers are UK Models and NOT grey imports.
Please take this into account when deciding where to purchase your printer.

Computer Concepts Laser Direct

Qume 300dpi 6ppm 859.57 1010.00
600 DPI Laser Direct Card 319.15 375.00
LBP4 Laser 600dpi 4ppm 659.57 775.00
LBP8 Laser 600dpi 8ppm 1319.15 1550.00

Canon

Bubblejet BJ10e 218.72 257.00
(Please Specify White or Black)
BJ300 355.74 418.00
BJ330 400.00 480.00

Citizen

120D+ (Parallel) 114.89 135.00
Swift 9 161.70 190.00
224 (Parallel) 199.15 234.00
Swift 24e 234.89 276.00
Swift 24xe 329.36 387.00

Hewlett Packard

Deskjet 500 338.72 398.00
Deskjet 500C (Colour) 535.32 629.00
(300dpi Full Colour)

Star

LC20 130.21 153.00
LC200 Colour 175.32 206.00
LC24-200 Mono 204.26 240.00
LC24-200 Colour 249.36 293.00

Arc/A3000 Applications

D.T.P.
Impression II (CC) 127.66 150.00
Impression Junior (CC) 72.34 85.00
Impress. Bus. Supplement (CC) 41.70 49.00
EasiWriter (Icon Technology) 133.62 157.00
Desktop Folio (ESM) 79.15 93.00

Spreadsheets
Sigmashet (Minerva) 40.00 47.00
Schema (Clares) 98.72 116.00
Eureka (Long. Logo.) 103.83 120.00

WordProcessors
1st Word Plus Rel. 2 (Acorn) 69.79 82.00
PenDown (Longman Logotron) 46.81 55.00
PenDown Plus (Long. Logo.) 68.08 80.00
EasiWord (Minerva) 16.17 19.00
Protext 5.0 (Arnor) 119.15 140.00

Integrated Packages
Pipedream 3 (Colton) 119.15 140.00
Desk Top Office (Minerva) 69.79 82.00

Databases
Datavision (Silicon Vision) 110.64 130.00
Flexifile (Minerva) 84.26 99.00
Multistore (Minerva) 154.89 182.00
Genesis II (Oak Solutions) 119.15 140.00
Knowledge Organiser (Clares) 41.70 49.00
PinPoint (Long. Logo.) 85.11 100.00

Accounting Software
Financial Accountant (S. Vis.) 208.51 245.00
Home Accounts (Minerva) 34.89 41.00
Business Accounts (Minerva) 298.72 351.00
Office Tools (S. Vision) 285.11 335.00

Languages
ANSI C Release 3 (Acorn) 124.26 146.00
Desktop C (Acorn) 188.94 222.00
Desktop Assembler (Acorn) 128.51 151.00
RiscForth (S. Vision) 110.64 130.00

Music
Armadeus (Clares) 61.28 72.00
Rhapsody II (Clares) 45.11 53.00
Tracker (Serial Port) 38.72 45.50
Notate (Long. Logo.) 51.06 60.00

Utilities
Arc DFS (Dabs Press) 22.98 27.00
Dot Matrix Colour Driver (Ace) 12.72 14.95
Compression (CC) 41.70 49.00

Education
Fun Sch. 3 Und. 5's (Database) 17.45 20.50
Fun Sch. 3 5-7 (Database) 17.45 20.50
Fun Sch. 3 Over 7's (Database) 17.45 20.50

Graphics Manipulation
Poster + Fonts (4Mation) 79.15 93.00
Render Bender II (Clares) 98.72 116.00
Graphbox Professional (Minerva) 104.68 123.00

Graphics - Art
Pro Artisan (Clares) 79.15 93.00
Revelation (Long. Logo.) 66.38 78.00
Revelation II (Long. Logo.) 102.13 120.00
Atelier (Minerva) 69.79 82.00
Clipart Coll. Vol. 1 (General) 19.95 23.45
Clipart Coll. Vol. 2 (General) 25.49 29.95
Clipart Coll. Vol. 3 (Animals) 25.49 29.95
Clipart Coll. Vol. 4 (Sport) 25.49 29.95
Clipart Coll. Vol. 5 (Characters) 25.49 29.95

Misc
ARCTiculate 17.45 20.50
PC-Emulator V1.7 (Acorn) 93.62 110.00

Tables

Investigator II (Serial Port) 22.98 27.00
Speech (Superior) 14.04 16.50
Arc to Skart + Audio 1.2m 8.72 10.25
Arc to Philips 8833 Mk II 1.2m 8.72 10.25
Arc Key'd Extension Cable 2m 7.87 9.25
Arc Mouse Extension Cable 2m 7.87 9.25
Arc Key'd Replacement Cable 7.02 8.25
Arc Mouse Replace. Cable 7.02 8.25
4 way trailing socket 5.11 6.00

Arc/A3000 Games

The Fourth Dimension
Adventures of Sylvia Lain 17.45 20.50
ARClst 17.45 20.50
Boogie Buggy 17.45 20.50
Break 147/Superpool 17.45 20.50
Cataclysm 17.45 20.50
Chocks Away Version II 17.45 20.50
Chocks Away Extra Missions 14.04 16.50
Chocks Away Compendium 26.81 31.50
Drop Ship 14.04 16.50
E - Type 14.04 16.50
E - Type Compendium 17.45 20.50
Enter the Realm 17.45 20.50
Grievous Bodily 'ARM 17.45 20.50
Holed Out Compend. 14.04 16.50
Inertia 14.04 16.50
Nevryon 14.04 16.50
Pandora's Box 17.45 20.50
Powerband V. II 17.45 20.50
The Real McCoy 1 or 2 20.85 24.50
Saloon Cars 17.45 20.50
Wimp Game 14.04 16.50
X-Fire 17.45 20.50

Arxe

Blitz 17.45 20.50
Bambuzle 14.04 16.50

C.I.S.

Chequered Flag 17.45 20.50
Microdrive 3D World Edition 21.70 25.50

Clares

Interdicter II 23.83 28.00

Cygnus

Tower of Babel 17.45 20.50
Twin World 14.04 16.50
Iron Lord 14.04 16.50

Domark

Mig-29 Super Fulcrum 29.79 35.00
3D Construction Set P.O.A.

Eclipse

Blowpipe 14.04 16.50
WorldScape 14.04 16.50

Eterna

Ballarena 14.04 16.50
Blaston 14.04 16.50
Bubblefear 14.45 16.50
Cartoon Line 17.45 20.50
Fine Racer 14.04 16.50
Kerbang 11.06 13.00
Leg. of the Lost Temple 17.45 20.50
Poizone 14.04 16.50
Rockfall 14.04 16.50
Thing of Darkness 20.85 24.50

Hybrid

Elite 31.92 37.50

MicroPower

Chess 3D 14.04 16.50
Zelanites 17.45 20.50

Krisalis

Chuck Rock 19.57 23.00
James Pond 19.57 23.00
Lemmings 19.57 23.00
Mad Professor Mariarti 14.47 17.00
Manchester Utd. 19.57 23.00
Manchester Utd. Europe 19.57 23.00
World Champ. Boxing Manager 19.57 23.00
World Champ. Squash 19.57 23.00

Simis

Flight Simulator Toolkit 31.49 37.00

Superior Software

Air Supremacy 17.45 20.50
Hostages 14.04 16.50
Master Break 14.04 16.50

Virgin

Magnetic Scrolls Collection 25.11 29.50
Wonderland 24.26 28.50

Please ring for current prices on software NOT listed here

PLEASE REMEMBER WHEN COMPARING PRICES - WE DO NOT CHARGE CARRIAGE
on standard delivery within mainland UK unless marked otherwise. Next day courier Service £6.00. Carriage on export orders charged at cost.

Branded Ribbons

Amstrad DMP2000/3160	5.53
Citizen 120D	3.83
Citizen Swift 24 Black	4.00
Citizen Swift 24 Colour	14.98
Epson LX80/86	4.00
Epson FX80, MX80, LX800	5.02
Epson LQ400, 550 Fabric	6.00
Epson MX100, FX1000, FX1050	6.77
Epson EX800/1000 Black	7.91
Panasonic KXP145, KXP115	7.91
Panasonic KXP140	10.00
Star LC10	4.26
Star LC10 4 Colour	6.51
Star LC200 Black	5.96
Star LC200 Colour	11.91
Star LC24/10 / LC24 200 Black	8.00
Star LC24 200 Colour	13.62

Compatible Ribbons

Amstrad DMP2000	3.40	4.00
Amstrad LQ3500, PCW8256	3.19	3.75
Brother M2024	5.11	6.00
Brother M1009, M1109	4.00	4.70
Brother HR10, 15, 20, 25, 35 Fabric	4.30	5.05
Brother HR10, 15, 20, 25, 35 MS	4.30	5.05
Canon PW1080A	4.47	5.25
Citizen 120D/Swift 24	3.49	4.10
Epson LX80, 86	2.98	3.50
Epson FX80, MX80, LX800, LX850	3.62	4.25
Epson FX1050, LX1000	4.43	5.20
Epson LQ500, LQ800, LQ850	4.17	4.90
Epson LQ1000, LQ1050, FX1000	5.32	6.25
Epson LQ2500, LQ2550	6.55	7.70
Epson EX800	6.55	7.70
Panasonic KXP1081/90, 1180/24	4.04	4.75
Seikosha GP100	3.53	4.15
Shanwa CP80 Multistrike	4.98	5.85
Star LC10/LC20	3.40	4.00
Star LC10 4 Colour	5.53	6.50
Star LC24/10, LC24/200	4.68	5.50
Star LC200 Black	3.40	4.00

Discounts available on all ribbons for quantities of 3 or more.

Please call for prices on any ribbons not listed here. We can supply almost any ribbon required and, dependent on quantity, any colour.

Please Note - Quoting the CARMA Group Code speeds up our search for a ribbon compatible with your printer.

Printer Cartridges

Canon LBP4 Toner Cartridge	55.32	65.00
Canon LBP8 Toner Cartridge	62.13	73.00
Canon BJ130 (BJ1481)	10.00	11.75
Canon BJ10e (BC01)	16.17	19.00
Canon BJ300/330 (BJ1642)	11.91	14.00
Cjet 132/Canon PJ1080 Black	9.36	11.00
Cjet 132/Canon PJ1080 Colour	14.48	17.25
HP Paintjet Black	20.00	23.50
HP Paintjet Colour	23.40	27.50
HP Deskjet + (Permanent Ink)	12.77	15.00
HP Deskjet 500C Colour	22.98	27.00
Qume Crystal Print Toner Set	66.38	78.00
Qume Crystal Print Drum Set	88.51	104.00



New Graphics Factory ClipArt

Four new Collections totalling over 1500 images.

Volume Two : General

The new general collection
Lots more artwork for you to
use covering an even greater
range of topics.
Over 650 Images

Volume Four : Sport

Most sports covered including
some of the more obscure events.
A must for all sport enthusiasts
Over 280 Images

Volume Three : Animals

The first specialist collection containing
all the animals you will ever need plus
fun and poster animals.
Over 300 Images

Volume Five : Characters

Knights, Cowboys, Cavemen & Clowns.
Large choice of characters to liven up
any document. Over 30 different Topics
Over 280 Images

Telephone (0772) 623000 for details

The Graphics Factory
250 Leyland Lane
Leyland
PRESTON
PR5 3HL

Only £29.95 inc. VAT each
Includes Graphics Factory
Sprite Utilities

The Graphics Factory
An Orion Computers Company

I.D.E.

**High performance Hard Disc Sub-Systems
for Archimedes & A3000 Computers**

Fast A.T. Bus Interface

Easy Installation.

Fit 2 Drives internally (A3/4/500)

A3000 Compatible

Tested with: Seagate, Quantum, Maxtor, Conner & Others.

Interface, Manual, and Cables

£139.00 inc. V.A.T.

	A3000	A300/400
20Mb	289.00	199.00
43Mb	369.00	279.00
52Mb (Cached)	419.00	329.00
105Mb (Cached)	519.00	429.00
120Mb (Cached)	579.00	489.00
200Mb	679.00	589.00
210Mb (Cached)	719.00	629.00
425Mb (Cached)	1119.00	1029.00

120Mb Drive for A5000 Only 429.00

All prices INCLUDE VAT @ 17.5%

Prices quoted include Card, Cables, Manual and Drive

A3000 Twin Podule Expansion System





Connect two 400 Series cards to your A3000 at the same time.
Both podules are available for use with no switching or extra
software needed.

Supplied in colour keyed case with full fitting instructions. No
soldering required.

£65.00 inc. V.A.T.

Bulk Diskettes

All our disks come complete with labels etc. and are 100% certified error free. In the event that a disk fails it
will be replaced immediately. Top row of prices ex. VAT. Bottom row of prices inc. VAT.

		Quantity					
		25	50	100	250	500	1000
	5 1/4 DS/DD 96tpi	N/A	14.00	26.00	60.00	114.89	208.51
		N/A	16.45	30.55	70.50	135.00	245.00
	MF/2DD 1Meg	9.74	19.57	34.00	85.11	161.70	297.87
		11.45	23.00	39.95	100.00	190.00	350.00
	3 1/2 Sony Bulk	12.51	25.11	45.11	105.53	200.00	378.72
		14.70	29.50	53.00	124.00	235.00	445.00
	MF/2HD 2Meg	18.72	37.45	68.00	162.55	295.32	530.21
		22.00	44.00	79.90	191.00	347.00	623.00

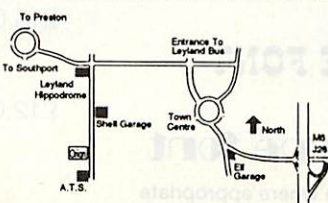
Ordering Information

Minimum Order Value £10.00 Minimum Educational Order Value £15.00. Please note VAT is shown at 17.5%

By Post

Please send your orders including a signed cheque, postal
order or credit card number & expiry date (NOT CASH) to:
Department BAU3
250 Leyland Lane,
Leyland, Preston,
PR5 3HL.

All cheques and bankers drafts to be made payable to
Orion Computers Limited



By Telephone

Telephone orders may be placed between 9:30am and 5:00pm
Please have your credit card number and expiry date ready
Tel: (0772) 623000 Fax: (0772) 622917

In Person

Callers most welcome. We are situated 3 miles from M6 J28.
Open Mon-Sat 9:30am - 5pm. (Please see map for directions)

The Electronic Font Foundry



New Fonts available from EFF

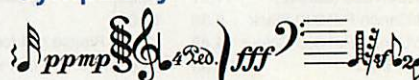
Aidan		£15.00
a well crafted uncial face, reminiscent of celtic script		
Allegro	Shelley Allegro Script™	£35.00
<i>A very beautiful, ornate script font</i>		
Andante	Shelley Andante Script™	£35.00
<i>A more restrained version of Allegro</i>		
Arnold	Arnold Boeklin™	£15.00
A popular Victorian decorative font		
Ascot Black	Linotext™	£18.00
A pleasant blackletter face complimenting our Ascot face		
Basia	Present Script™	£18.00
A free-spirit script font, with some unusual features		
Bob	Melior™	£35.00
Bob Regular, <i>Bob Italic</i> , Bob Bold , Bob Bold Italic		
Digital		£16.00
An LCD typeface, so well designed it can be used for body copy!		
Eric 1	Gill Sans™	£35.00
Eric Regular, <i>Eric Italic</i> , Eric Bold , Eric Bold Italic		
Eric 2	Gill Sans™	£18.00
Eric ExtraBold, Eric UltraBold		
Eric 3	Gill Sans™	£25.00
Narrow, Bold Narrow , UltraBold Narrow		
Franca	Dom Casual™	£15.00
A script font with a handwritten look and feel		
Lipa	Juniper™	£12.00
THIS IS A UNUSUAL, SLIGHTLY CONDENSED, EVEN FACE		
Mr Jones		£25.00
An ultra-modern light display face, with italics		
Shel		£25.00
A beautiful slightly cursive sans serif, with italics		
Sheriff	Cottonwood™	£15.00
A POPULAR "WESTERN" TYPE FONT		
Soho Black	Broadway™	£12.00
A decorative twenties-type font		

Font names are © EFF, Adobe, Bitstream and Monotype where appropriate

Cartograph £25.00

 a map symbols font

Symphony £25.00

 a music symbols font

Braille £6.00



Canon BJ10e Driver

360dpi using all 64 nozzles
Make full use of your Bj10e
£10.00

We have the largest range of fonts available for the Archimedes, all properly hinted and well made by professionals. All of our near 250 fonts are available in all the Latin alphabets. We have 50 foreign fonts, including: Greek, Vietnamese, Russian, Hebrew, Bengali, Tamil, Punjabi, Gujarati and Devanagiri.

Our DTP department is second to none, we can provide help and advice on any DTP matter. We sell DTP related hardware and software and provide a complete telephone help service to any of our customers who need it.

For a free catalogue and pricelist, with details of our Fonts, Hardware and Software, please call or write.

For all orders please add:
£2.50 p & p and 17½% VAT.

The **Electronic Font Foundry**
Granville House
50-52, Upper Village Road
Ascot, Berkshire, SL5 7AQ

Telephone: 0344 28698
Facsimile: 0344 872923

All prices are ex-delivery & VAT, and are subject to change.



BANK MANAGER

Complete and versatile personal accounts program. Consistently acclaimed!
'data entry is a delight...professional...excellent product' Micro User April 86
Standard version: Enter cheques and receipts. Automatic date sequencing. Reconcile statements. Search, amend and delete. Analyze expenditure. Forward cash flow forecast. Budgets. Up to 36 bank accounts online, inter account transfers, 9999 standing orders, 99 analysis headings, over 4,000 postings on an 80k diskette. Reports to screen or printer. Mix foreign currencies, graphics, password, file recovery, field editing, programmable reports.
Master/Compact version adds ADFS/hard disk support, sideways RAM, 40/80 col screen reports, and other enhancements.
Archimedes/A3000 adds high speed native mode, RAM disks, wild card analysis enquiries, sort and more. *'Impressed...ideal...easy to use' Micro User March 88*
Bank Manager (all versions; disk systems only) £25.00

BANK MANAGER BUSINESS UTILITY

For the club accounts or small business user. From the Bank Manager data files print "trial balance" or "P&L reports" via the programmable spreadsheet generator.
Business Utility Pack (needs the Bank Manager) £12.00

TYPING TUTOR

Quickly learn to touch type. Over 90 smoothly graded lessons graduate you from the basic home keys to complete keyboard mastery. Word scan or exact key checking, targets may be revised, rhythm metronome, key click, free format options. Recommended for adult education.
Typing Tutor £15.00

SPREADSHEET MK V

Low cost, versatile spreadsheet. 26 cols, 900 (Arch/A3000) or 99 (B/Master) rows, many functions and facilities inc programmable report writer and input scripts.
Spreadsheet MK V disk £15.00

All programs available in B, Master/Compact and Archimedes/A3000 versions. Archimedes/A3000 versions are RISC OS compatible

State type of computer (eg A3000, B, Master) and disk type (eg 3 1/2" or 5 1/4" 40 track or 5 1/4" 80 track). Please add £1 P&P (Overseas £3.50)

CONTEX COMPUTING

(Ref AU), 15 Woodlands Close,
 Cople, Bedford MK44 3UE



Tel: 0234 838347

JR Letronics Co

- * Super Archimedes Computers
- * A540, A5000, A3000 & others
- * Computer Peripherals
- * Educational & Business Software
- * Manuals, Discs & Paper

Proprietor:
 J.H. JARLETT

Acorn

The choice of
 experience

081-977 8053 (TEL/FAX)


The Annexe 2 Broad Street Teddington

(Entrance in Queens Rd) Middlesex TW11 8RF

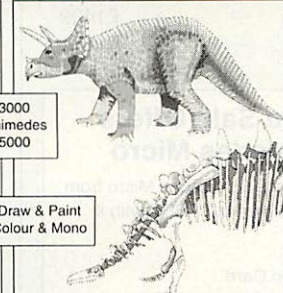
Mon to Fri 10 to 5 Sat 10 to 2

After-sales helpline - We try to help

Select Your Own Clipart and Data Files



Columbus - £4.95



Extinct Animals - £4.95

Order directly from DEC_dATA or send a £1 for the Auto-Catalogue/Sample Disc to:

DEC_dATA for Image, Clip Art and Data Files
 60 Danes Road, Exeter EX4 4LS 0392 221702

Use the **Auto-Catalogue** to choose and order the Clip Art and Data Discs you want for £4.95 or make your own selection of individual files for just £6.95 per disc full.

Star maps, Animals, Flags, Famous People, India, Steam Locomotives, Australia, Volcanoes, Inventions, Computers, Sailing boats, Dolphins, DTP art. Also - Quest, Grass, MultiStore and SystemDelta files.

Want a dirt cheap Archimedes Computer ?...

... don't come to us!

However, we can offer you...

- Expert advice on the best Archimedes hardware and software for your needs
- Fast, courteous mail order service, once you have decided what you want to buy
- After sales service from people who know what they are talking about
- A magazine which we publish, called "Archive", to keep you up-to-date
- Special discounts for Archive subscribers on both hardware and software

Why not give us a call and talk to Paul or Adrian?

...Remember, price isn't everything!

Norwich Computer Services

96a Vauxhall Street, Norwich NR2 2SD. Phone 0603-766592. Fax -764011

Computer Holiday for young people !!

Scripture Union runs a computer holiday for 13 to 16 year olds at an attractive school set in the Hertfordshire countryside. The dates? August 3rd to 11th. The price? £101. For details, write to Jim Maddox, S.U. Holidays, 69 Cloverdale Road, London SW2 2DH or phone 081-671-8761.

Watford Electronics

(A member of the Jessa group of Companies – Established 1972)



Jessa House, 250 Lower High Street, Watford WD1 2AN, England

Tel: Watford (0923) 237774 Tlx: 8956095 Fax: (0923) 233642



**The sign of
Quality**

Shop Hours: 9am to 6pm (Mon.-Sat.) Thursday 9am to 8pm. FREE customer car park.

All prices exclusive of VAT; subject to change without notice & available on request.

**The choice
of Experience**

Archimedes micro

System	Basic	Mono	Colour	Multiscan
A410/1	£699	£765	£859	£1024
A540/1	£2495	£2555	£2655	£2815
A3000	£599	£665	£759	£924
A3000L/C	£642	£708	£802	£967
A5000	£999	£1065	£1159	£1324
A5000H/D	—	—	—	£1499
A5000L/C	—	—	—	£1531

Unbeatable Sale Offers on Archimedes Micro

When you purchase an Archimedes Micro from Watford, look what you get FREE with it

Micro	Free Offer
A410/1	ARM 3 Turbo Card
A540/1	Multiscan monitor with VIDC enhancer and LC20 Printer
A3000	2Mb RAM; Monitor plinth and Acorn's A3000 Shoulder Bag (carrying case)
Plus of course our no quibble 12 months FREE On-Site Maintenance on all Archimedes Micros.	

Archi Accessories

• 3.5" 800K 2nd Floppy Drive (305/310)	£118
• 5.25" 800K external Floppy Drive	£85
• I/O Podule (Analogue/User/1MHz bus)	£79
• I/O Podule (Analogue/User)	£49
• MEMC 1A Upgrade	£42
• MIDI add-on to I/O Podule	£27
• MIDI Expansion Card	£65
• Sound Sampler Mono (Armadillo)	£129
• Sound Sampler Stereo /Midi (Armadillo)	£186
• Chromalock Podule (Wild Vision)	£275
• Econet Network Board	£42
• Archimedes IEEE Interface Adaptor	£269
• Dual RS232 Podule	£195
• 16 bit parallel I/O Card	£195
• Archi replacement mouse – New design	£32
• PC Emulator v1.7	£85
• Software Developers Toolbox	£149
• Floating Point Unit	£455
• SCSI Adaptor Expansion Card	£156
• Keyboard Extension Lead	£6
• 2 Podule Backplane	£25
• 4 Podule Backplane	£38
• Fan for above backplanes	£8
• Risc Os Extras Software Disc	£5
• Ethernet Card	£220
• SCSI Card 8 bit	£129
• A5000 – 2 to 4Mb RAM Upgrade	£122

A3000 Accessories

• 3.5" External Drive	£95	• Monitor Stand	£15
• Technical Manual	£39	• Serial Upgrade	£17
• A3000 Dust Cover	£5		
• A3000 plus Monitor Dust Cover			£9
• A3000 User Port/Midi Upgrade Card			£44
• A3000 User/Analogue/IIC I/O Card			£42
• A3000 External Podule Case			£13



**CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383**

Coming Soon

Aries 386SX-25MHz PC Card for the Archimedes micro. Watford's R&D team have spent 1000's of man hours to bring you a full specification PC card for the Archimedes. You no longer require Acorn's PC Emulator as all PC software is run locally on the expansion card with custom written software to interface the PC card into the RISC OS environment. Watch this space for further details.

Winter Sale Archimedes A3000 Desk Top Publishing (DTP) Offer

A3000 BBC Archimedes Micro with 3.5" Floppy Disc Drive and a mouse, upgraded to 2Mb RAM, COLOUR Monitor + Lead, 20Mb fast IDE Hard Disc Drive, 'Compression' Utility to increase the Hard Drive capacity to Typically 40Mb, The highly acclaimed Computer Concept's Impression Junior DTP software package.

RRP: £1299

Sale Offer Price: £849

Above Package plus Acorn's Learning Curve £892

**Special Education discounts
available on above package, micros,
RAM upgrades, ARM 3 Turbo Card,
etc. Please write in or telephone:
(0923) 237774/250335**

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

• R302-A3000 – to 2MB RAM Upgrade	£39
• R303-A3000 – to 2MB RAM Upgrade	
(expandable to 4MB)	£65
• R304-A3000 – to 4MB RAM Upgrade	£139
• R311-A305 – to 1MB RAM Upgrade	£30
• R312-A305/310 – to 2MB RAM Upgrade	£149
• R314-A305/310 – to 4MB RAM Upgrade	£265
• R412-A410/1 – to 2MB RAM Upgrade	£35
• R413-A420/1 – to 4MB RAM Upgrade	£64
• R414-A410/1 – to 4MB RAM Upgrade	£98
• R810-A410/1 – to 8MB RAM Upgrade	£599
• R820-A420/1 – to 8MB RAM Upgrade	£569
• R840-A440/1 – to 8MB RAM Upgrade	£499
• R814-R140 – to 8MB RAM Upgrade	£499
• A5000 – to 2MB additional RAM Upgrade	£123

**0% Finance & Special
Teachers/Academics' prices
Now available on A3000L/C
and A5000 L/C Micro Systems**

Convert your Archi 410 to a 420 or 440 with Watford's unique Upgrade Kits

UP10 – to 2MB RAM + 20MB Hard Disc	£159
UP15 – to 2MB RAM + 40MB Hard Disc	£245
UP20 – to 4MB RAM + 20MB Hard Disc	£225
UP30 – to 4MB RAM + 40MB Hard Disc	£309
UP40 – to 4MB RAM + 53MB Hard Disc	£429

Graphics, Art, Design & Games

GRAPHICS		Puncman 3 & 4	
ARCTist	£19	Pysanki	£15
ARCTiculate	£19	Quazer	£10
Atelier	£65	Real McCoy	£22
Artisan II	£45	Real McCoy 2	£23
Artisan Gallery	£16	Redshift	£14
Autosketch II	£65	Return to Doom	£16
Craftshop 1 & 2	£28	Revelation	£54
Euclid 2	£50	Repton 3	£15
Graph Box	£59	Rotor	£19
Graphbox Professional	£118	Saloon Cars	£19
HotLink Presenter	£40	Splice	£25
Kermi	£46	Sporting Triangles	£24
Mogul	£17	Star Trader	£14
Poster	£79	Superior Golf	£15
Pro Artisan	£70	Super Pool	£19
Prime Art	£69	Talisman	£12
Render Bender	£58	The Pawn	£19
Snippet	£21	Thundermonk	£11
Tween	£21	Timewatch	£24
		Trivial Pursuit	£22
		Twin World	£15
		U.I.M.	£23
		White Magic	£15
		White Magic 2	£15
		Wimp Game	£13
		Worldscape	£16

GAMES		Miscellaneous	
Air Supremacy	£20	Ancestry	£59
Apocalypse	£15	Arccomm 2	£38
Arcade Soccer	£15	Arclerm 7	£64
Boogie Buggy	£19	Armadaus Sound	£60
Break 147	£19	BBC DFS Reader	£6
Bug Hunter	£14	Blowpipe	£17
Caverns	£14	Broadcaster Loader	£65
Chess 3D	£14	Compression (CC)	£44
Chocks Away	£14	Equasor	£47
Chocks Away Extra	£14	FlexiFile	£98
Conqueror	£18	Genesis	£65
Cops	£14	Genesis 2	£113
Corruption	£18	Hearsay Comms	
Crisis	£21	Pack	£50
Elite	£33	Investigator 2	£22
Enter the Realms	£19	JX Archi Colour Printer	
Enthar Seven	£21	Driver for Citizen &	
E-Type	£14	Star Printers	£15
E-Type Designer	£13	Numerator	£66
Family Favourites	£15	Presenter 2	£35
Fireball 2	£19	Presenter Story	£145
Holed Out Designer	£13	QEEM 386	£59
Holed Out Golf	£13	Rainforest	£17
Hostages	£15	Revelation	£58
Ibix the Viking	£14	Rhapsody in Blue 2	£45
Inter Dictor 2	£26	Show Page	£127
Iron Lord	£15	Speech!	£15
Jiglet	£25	The Victorian	£17
Jigsaw	£27	Time Tabler	£549
Lemmings	£22	Toolkit (Clares)	£35
Masterbreak	£16	Touchtype	£40
Maggie	£39	Tracer	£46
Man at Arms	£16	Tracker	£39
MahJong Patience	£15	Vox Box	£47
Manchester United		WorldScape	£17
Europe	£19		
Nevryon	£14		
Olympics	£15		
Pipe Mania	£17		
Pirate	£16		
Power Band	£18		
Puncman 1 & 2	£16		

Archimedes Hard Disc

Watford's ST506 Hard disc drives for A310 & A410 series fit internally into the space provided.
P.S. A310 upgrades require a backplane and a fan.

• 3HDP – Hard Disc Podule only	£135
• 3HD20 – 20Meg H' Disc + Podule for 310	£235
• 3HD40 – 40Meg H' Disc + Podule for 310	£345
• 3HD50 – 53Meg H' Disc + Podule for 310	£474
• 4HD20 – 20Meg Hard Disc for 410	£129
• 4HD40 – 40Meg Hard Disc for 410	£215
• 4HD50 – 53Meg Hard Disc for 410	£335
• A3000 20Meg Hard Disc + Podule	£299
• A3000 40Meg Hard Disc + Podule	£429

For Archimedes IDE Hard Disc turn to page 14

Desk Top Publisher

Acorn's Archi DTP Package	£108
Equasor	£39
Impression 2 DTP Pack	£125
Impression Junior	£72
Expression-PS	£19
Tempest DTP Package	£90

More Archimedes Products See Pages 3, 5, 6, 8, 10, 14

Archi Wordprocessors

Pendown Archi	£48	Archie Spell Master	£25
Wordwise + Disc	£24	PD Spellchecker	£40
Image Writer	£25	View	£45
Interword Disc	£24	Graphic Writer	£19
1st Word Plus – 2	£63	EasiWord	£18

Databases

AlphaBase	£36	Magpie	£40
Knowledge Organiser	£42	Multistore v2.01	£185

Spreadsheets

Intersheet Disc	£24	Schema	£89
Viewsheets	£45		

Business Graphics

GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

Integrated Packages

- Logistix £79 • Pipedream 4 £149
- Desktop Office – Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio – Wordprocessor, Desktop & Interactive Publishing. Ideal for school environment. £75

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example programs.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

£42

Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes.

£15

Silicon Vision

Gerber Plot	£95	Solids Render	£120
Solid CAD	£120	Solid Tools	£279
Super Plot	£28	Data Vision	£110
Super Dump	£22	Share Holder	£135
Arc PCB Professional			£275
Realtime Solids Modeller			£136

Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.

New RISC OS Version

Only £15

Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.

- A300/A3000 £21 • A400 £25

Watch this space for our Low Cost – High Performance 4Mb and 8Mb RAM Upgrades for the A5000

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77	£77 each
Assembler; LISP; Prolog X	£149 each
ANSI C Rel. 3	£125
BASIC Compiler	£77
Cambridge Pascal	£60
Logotron Logo	£45
Macro Assembler	£40
Risc Basic	£120
Robo Logo	£69
Risc FORTH	£110

NEW

256 Grey-Scale Scanner

Watford proudly introduces its new innovative 256 grey-level hand scanner for the Archimedes range of micros. It offers up to 400 dpi scanning resolution, complete with software.

256 Grey-Scale Scanner is ideal for incorporating pre-drawn logos, artwork, photographs and sketches into desktop publishing documents and other graphics programs. Designed by our own R & D team, it offers the best overall scanning solution for Archimedes micro. Just compare the competition on our price and these outstanding features:

- Full 105mm 400dpi scanning operation in just 3mS per line! (Twice as fast as most scanners.)
- Selectable 256/16/4 grey levels
- Full scan preview, scale to fit windows
- Complete set of image enhancement tools
- Single width podule
- True brightness and contrast control
- Fast RISC OS printing
- Five-function edge detection software, Laplace convolution matrix image enhancement, image smoothing, etc.

Special Launch Price

£185

ULTIMUM – Archimedes A3000 Podule Racking System



THE ONLY LOGICAL WAY TO
EXPAND YOUR A3000 COMPUTER

Price: £149

Minerva's Archimedes Software

EasyWord	£18	Mailshot*	£27
Home Accounts	£35	Reporter*	£27
Time Tabler	£549	School Admin*	£65
System Delta	£59		

System Delta Program Reference Manual £29

* Requires System Delta to operate

Stand alone Business Accounts Packages

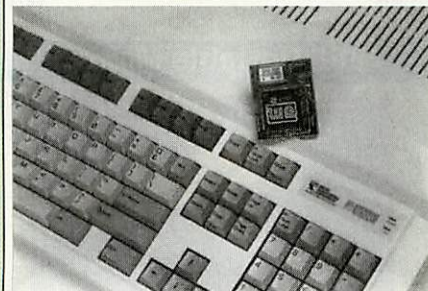
Sales; Purchase; Order Processing and Invoicing;
Nominal; Stock management

£79 per module

or Complete Business Package £325

ARM 3 Turbo Card

Simply The Best



Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £199. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.

Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £18.

(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

In response to many of our customers requests, we have extended the Offer Price to 28/2/1992.

RRP £249

Offer Price £185

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

Continued → → → → → → → → →

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheets, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) £399

FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mailist, Easyledger, Invoice & Statements, Stock Control.

FREE with every BBC Master purchased from us during February

Add-Ons & Accessories

Econet Module for the Master	£45
Twin ROM Cartridge for Master	£9
Quad ROM Cartridge for Master	£14
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref Manual	(No VAT) £17
64K Upgrade Kit for B+	£32
Acorn 1772 DFS Kit complete	£49
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238
Morley Teletext Adaptor with ATS Rom	£99
Ecolink	£270

Z88 Portable Micro



£179

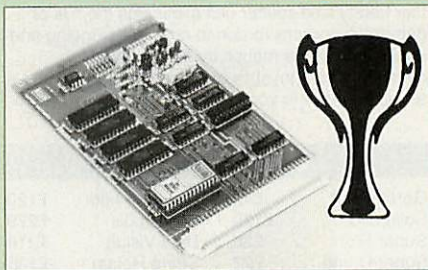
FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

Z88 ACCESSORIES

• 32K RAM Pack or 32K EPROM Pack	£16
• 128K RAM Pack or 128K EPROM Pack	£32
• 512K RAM Pack	£86
• Z88 Eeprom Eraser Unit	£38
• Z88 Spellmaster for Pipedream	£40
• Z88 Carrying Case	£8
• Z88 Computing Book	£9.95
• AA Nicad Rechargeable Battery	£1.50
• Battery Charger Compact & Fast	£6
• Z88 Serial Printer Cable	£8
• Z88 Parallel Printer Cable	£18
• Z88 to Archi Link	£15
• Z88 to BBC Link	£8
• Z88 to PC Link II	£27
• Z88 to Macintosh	£32
• Z88 Mains Adaptor	£9
• Z BASE	£56
• Z TAPE	£42
• Z TERM	£42
• Z88 Modem	£114

Archi Real-Time Digitiser



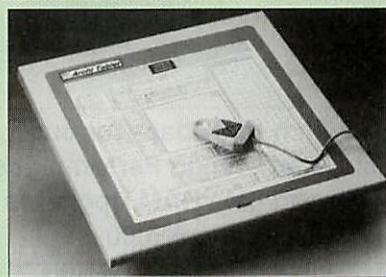
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £139

A Set of Colour Filters for colour image grabbing using a video camera **£16**

Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).

(FREE this month, PC Mouse Drivers & Art package)

Special Price £175

(Price includes Tablet, Leads, Software & Puck) Stylus Optional Extra £15

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus £110

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: £2



Acorn & Watford DFSs

• Watford sophisticated DFS ROM	£16.00
• Watford DFS Kit complete	£69.00
• We will exchange your existing ROM for Watford's ultimate DFS ROM at only	£12.00
• DFS Manual (comprehensive)	£6.95
• Acorn DNFS ROM	£17.00
• Acorn ADFS ROM only	£25.00
• Acorn 1772 DFS ROM Kit	£49.00

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only **£39.00**.

- SPECIAL PRICE **£44.00**
- DDFS Manual (No VAT) **£6.95**
- We will exchange your existing DFS Kit for our sophisticated DDFS for only **£30.00**

Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.



3M – Diskettes

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor

• 10 x 5.25" S/S D/D 40T (744)	£5
• 10 x 5.25" D/S D/D 40T (745)	£5
• 10 x 5.25" S/S D/D 80 Track (746)	£7
• 10 x 5.25" D/S D/D 80 Track (747)	£7
• 10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT	£9
• 10 x 3.5" S/S D/D 40/80 Track	£7
• 10 x 3.5" D/S D/D 40/80 Track	£7
• 10 x 3.5" Double Sided High Density	£13



Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

• 10 x M3 3.5" D/S D/D 80 Track	£7
• 10 x M9 3.5" D/S High Density	£12
• 10 x M4 5.25" S/S D/D 40 Track	£5
• 10 x M5 5.25" D/S D/D 40 Track	£5
• 10 x M7 5.25" D/S D/D 80 Track	£7
• 10 x M8 5.25" D/S H/D Hi-Density	£9
• M2 3" Double Sided	£2.50 each



**CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383**

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Various UK "manufacturers" of disc drives for the BBC Micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

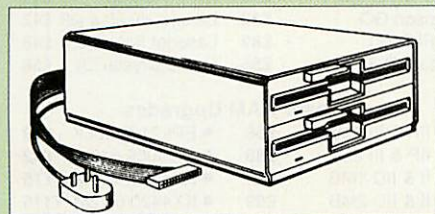
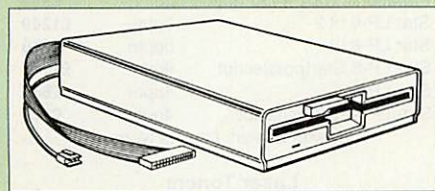
If you look around the popular BBC Micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.**

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space. Your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double Plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"



Our Disc Drives conform to BS415

Type	Description	
Disc Drive without PSU		
• CLS400S:	Single, 40/80 track 400K Double sided Drive	£70
• CLD800S:	Twin, 40/80 track, 800K Double sided Drives	£138
Disc Drive with PSU		
• CS400S:	Single, 40/80 track, 400K Double sided Drive	£80
• CD800S:	Twin, 40/80 track, 800K Double sided Drives	£153

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Disc Drive/DDFS Offer



- The popular CLS400S 40/80 track switchable disc drive.
- Watford's popular Mk II DDFS Interface (allows up to 720K storage). Will run both in single & double density modes.
- A comprehensive DFS Operating manual

Bargain at Only £116 (Offer valid until stocks last)

3.5" DISC DRIVE

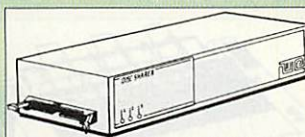


These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
Disc Drive without PSU		
• CLS35:	Single Disc Drive, 400K	£62
• CLD400S:	Twin Disc Drives, 800K	£109
Disc Drive with PSU		
• CS35:	Single Disc Drive, 400K	£83
• CD35:	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drive Sharer



(Ideal for educational establishments)

A low cost alternative to the Econet system. Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC Micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Price includes 3 Cables **£55**

Disc Drives in Monitor Stand



- **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

- **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

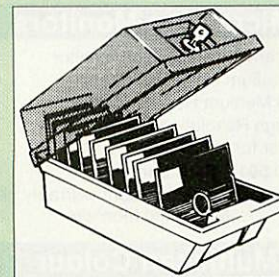
£154

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Antistatic Lockable Disc Storage Units

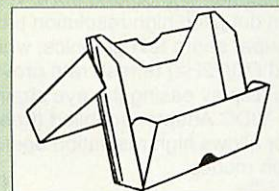


Gives double protection – Strong plastic case that affords real protection to your discs. Antistatic helps avoid data corruption whilst in storage. The smoked top locks down. Dividers and adhesive title strips are supplied for efficient filing of discs.

- M35 – holds up to 50 5.25" discs **£4.95**
- M85 – holds up to 95 5.25" discs **£6.95**
- M25* – holds up to 25 3.5" discs **£4.95**
- M50 – holds 50 3.5" discs **£6.50**
- M10 – holds 8 of No. 10 Data Cartridges **£15**

* Not lockable

Plastic Library Cases



- Holds up to 10 x 3.5" Discs. **£1.50**
- Holds up to 10 x 5.25" Discs. **£2.00**

Dust Covers (For our Disc Drives)

- Single CLS (without PSU) **£3.20**
- Single CS (with PSU) **£3.25**
- Twin CLD (without PSU) **£3.85**
- Twin CD (with PSU) **£3.90**

Disc Albums

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

£4

Special Bulk Offer on Discs

(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)

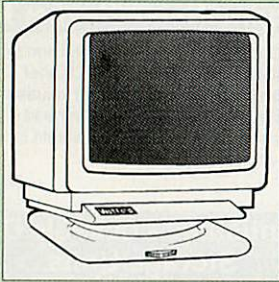


PRICES SLASHED

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£30	£35	£40
• With Sleeves 5.25"	£33	£38	£43
• 3.5" D/S D/D	£27 for 50	£49 for 100	

Continued → → → → → → → → →



Microvitec Monitors

• 1431 - Standard Resolution Monitor	£169
• 1451 - Medium Resolution Monitor	£209
• Cub3000 Medium Res for A3000	£189
• 1441 - High Resolution Monitor	£359
• Dust Cover for Microvitecs	£5.50
• Touchtec 501 Touch Screen	£239

Now 3 years Parts & Labour warranty on all Microvitec Monitors

Multiscan Colour

• Eizo 9060S	£389	• NEC 6FG	£1525
• Eizo 9070S	£579	• Taxan 770LR	£362
• NEC 3FG	£370	• Taxan 775	£362
• NEC 4FG	£465	• Taxan 795	£402
• NEC 5FG	£850	• Taxan 875	£685
• VIDC Enhancer Board	£25		

(P.S. Taxan 795 monitor is supplied with a FREE VIDC enhancer board)

Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexibility of any 14" colour monitor for the Archimedes micro.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes.

£325

Philips Monitors

• BM7502 12" Hi-res Green Monitor	£67
• BM7522 12" Hi-res Amber Monitor	£67
• CM8833 14" Med. Res Colour Monitor	£165
• Dust Cover for Philips Monitors	£6

STAR BUY

- PHILIPS 14" Medium Res, dark glass, attractively finished Colour Monitor. A push-button switch toggles between Hi-Res monochrome green text mode and full colour display. (Please state the type of Connecting Lead you require).

ONLY £164

Refurbished Monitors

Philips 14" Refurbished Colour Monitors, same specification as the 'Star Buy' Monitors above **£119**
(Offer valid while stocks last)

Spare Monitor Leads

BNC Lead for Zenith or Philips	£3
Skart Monitor Lead	£5
RGB lead for TAXAN Monitors	£3
Archimedes Colour Monitor Lead	£7.50

Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

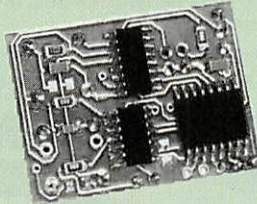
£12

Aries 2000 Colour Monitor

This attractively finished, etched screen medium res monitor is supplied complete with built-in speaker, volume control and video output. All controls are located on the front panel for ease of use. Ideal for BBC, BBC Master, Archimedes and Amiga.

A bargain at £159

Watford VIDC Enhancer



This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

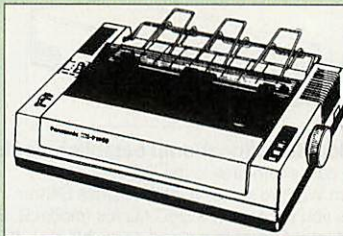
Super VGA VIDC Card: This provides support for both VGA and Multisync monitors. A unique electronic design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control

£45

MultiVideo VIDC Card: As above but for MultiScan monitors only.

£25

Panasonic Printers



• KX-P1123	£129	• KX-P1654	*£335
• KX-P1124i	£173	• KX-P1695	*£272
• KX-P1170	£100	• KX-P2624	*£295
• KX-P1624	£272		

* Price includes 12 months On-site warranty

Cut Sheet Feeders

P36 - 1124/24i	£79	P37 - 1123/70/80	£69
P38 - P1624/95; P2624			£129

Buffers

P12 4K Buffer Board for KX-P1081	£55
P14 32K Buffer P1123/24/70/80	
P1540/92/95; P1624/54/95	£16

Serial Interfaces

P19 for P1123/24/24i/70/80/1624/54/95/2624	£49
--	-----

Citizen Printers

• 120D Plus	£100	• Swift 9	£129
• 124D	£145	• Swift 24E#	£249
• 224	£185	• Swift 24X	£299
• PN-48	£209	• PN48 Ribbon	£4

FREE Colour Option with Swift 24E

• Swift 24 Colour Option	£29
• Swift 24 Ribbons Black £4	Colour £13
• Citizen/Archimedes Colour Printer Driver	£15

Integrex Colour Jet

• Colour Jet 132 Printer	£449
• Paper Roll	£6.50
• BBC Screen Dump Software	£10
• Colour Cartridge	£21
• Black Cartridge	£12.40
• 100 A4 OHP transparencies	£55
• 8K Serial Interface Optional	£123

Star Printers

• LC15	£173	• SJ48 Inkjet	£174
• LC20	£100	• XB24-200 Colour	£295
• LC24-10	£133	• XB24-250 Colour	£355
• LC24-15	£240	• XB24 Colour kit	£29
• LC24-200	£164	• ZA200 Colour	£234
• LC24-200 Colour	£203	• ZA250	£297
• LC200 Colour	£143		
• Star/Archimedes Colour Printer Driver			£15

Star Accessories

Cut Sheet Feeder

LC10/200/24-10	£65	LC15/LC24-15	£125
XB24-10	£80	XB24-15	£139

Serial Interfaces

8K Ser LC-200; LC24-200; FR10; FR15;	
XB24-10; XB24-15	£55

Paper Roll Holders

LC-200; LC24-200; LC24-200 colour	£29
-----------------------------------	-----

Buffers

32K Ram Card for LC/XB24-10; 15; LC200	£55
--	-----

Ribbons

LC10; LC10-II; LC15	Black £4;	Colour £6
LC-200; LC24-200	Black £5;	Colour £12
XB24-10; XB24-15	Black £5;	Colour £12

Laser Printers

All Laser Printers include 12 months On-site maintenance

• Canon LBP-4+	4ppm	£575
• Canon LBP-8 III	8ppm	£970
• Canon LBP-8 IIIR	8ppm	£1440
• Canon LBP-8 IIIT	8ppm	£1340
• Epson EPL4100	6ppm	£620
• Epson EPL7500	6ppm	£1159
• HP Laserjet IIP+		£625
• HP Laserjet III	8ppm	£1015
• HP Laserjet IIID	8ppm	£1720
• HP Laserjet IIIP	4ppm	£695
• HP Laserjet IIIsi	16ppm	£2695
• Panasonic KX-P4420	8ppm*	£620
• Panasonic KX-P4450i*	11ppm*	£925
• Panasonic KX-4455 Postscript	11ppm*	£1450
• Panasonic KX-P4430 Satin Print		£999
• Star LP-8 III 2	8ppm	£1249
• Star LP-8 III	8ppm	£910
• Star LP-8 Star(post)script	8ppm	£1140
• Star LP-4	4ppm	£565
• Star LP-4PS Postscript	4ppm	£779

* Now with 2 years On-site warranty

Laser Toners

Canon 2, 3 & 4	£46	KX-P4420/50	£19
Epson GQ	£13	Laserjet HP IIP & IIIP	£42
EPL7100	£82	Laserjet II/D, III/D	£48
Star LP-8	£56	Qume Crystal (3)	£58

Laser RAM Upgrades

• IIP & III 1MB	£56	• EPL7100 256K	£39
• IIP & III 2MB	£88	• GQ5000 512K	£42
• II & IID 1MB	£64	• KX4420/50 1M	£75
• II & IID 2MB	£99	• KX4420/50 2M	£115
• II & IID 4MB	£146	• KX4420/50 4M	£195
• Canon LBP4 1M	£105	• Star LP8 1M	£139
• Canon LBP8 2M	£125	• Star LP8 2M	£275

Laser Drum & Developer

• Epson Drum GQ5000	£93	EPL7100	£129
• Panasonic 4420 Drum	£60	Developer	£59
• Panasonic 4450 Drum	£93	Developer	£80
• Qume Drum	£76	Developer	£56

Jetpage Postscript Cartridge

• HP IIP/III	£229	IID & IIID	£235
--------------	------	------------	------

Various Add-Ons

• Laserjet Appletalk Interface	£135
• HP Adobe Postscript	£399
• Pacific Page Postscript	£259
• HP Premier Font Collection	£28
• Jetfont Superset for II & IID	£127
• Laserjet various Font cartridges	from £45

Hewlett-Packard Printers

• # Desk Jet 500	£275	• Paintjet XL	£1045
• Desk Jet 500 Col.	£475	• Quiet Jet Plus	£384
• Desk Jet Cartridge	£14	• HP Think Jet	£265
• Paint Jet Colour	£430		

Now 3 years extended Parts & Labour warranty

• Paintjet Cartridges Black	£19;	Colour	£25
• Desk Jet 500 256K RAM cartridge			£129
• HP Epson FX Emulation Cartridge for Desk Jet			£59
• Desk Jet Unlimited (Book No VAT)			£19.75

Canon Bubblejet Printers

Printer	CSF	D'ble Bin	Ink Cart
BJ10EX	£185	£43	£16
BJ300	£337	£88	£12
BJ330	£380	£110	£79
BJC800C	£1549		
• Spare Battery pack for BJ10E			£33

NEC Pinwriter Printers

• P20	£180	• P70	£419
• P30	£240	• P90	£635
• P60	£335		
• P60/70 Colour Option Kit			£59
• Ribbons Black for P20/30 £6		for P60/70/90	£7
• Ribbons for P60/70/90 Black £9		Colour	£13.50

Cut Sheet Feeders

P20	£59;	P30	£85;	P60	£89;	P70/90	£80
-----	------	-----	------	-----	------	--------	-----

Epson Printers

DFX5000	£1079	LQ1060 Colour	£595
DFX8000	£1979	LQ1070	£315
FX850	£264	LQ1170	£437
FX1050	£336	LQ2550+	£675
LQ200	£162	LX400	£101
LQ450	£165	LX850+	£140
LQ570	£205	LX1050	£206
LQ860 Colour	£440	SQ850	£432
LQ870	£368	SQ2550	£625

Cut Sheet Feeders for

LX400/800/850/LQ400/500/550	£69
EX800/FX800/850/LQ800/850	£130
FX/LQ 1000/1050/SQ850	£159
LQ 2550	£390
SQ2550	£390

Tractor Feed for

LQ800	£44;	LQ850/FX850	£69;	LQ1050/	
FX1050	£85;	LQ2500	£90;	LQ2550	£90.

Accessories

• EX800/1000 Colour Option	£45
• EX800/1000 Colour Ribbon	£14
• LQ2500 Colour Option	£65
• Multifont Card for LQ550/850/1050	£95

Epson Printer Interfaces

All these interfaces fit inside the printer

RS232	£28	RS232 + 2K Buffer	£52
-------	-----	-------------------	-----

Printer Leads

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Nimbus Centronics Lead	£6
IBM/Archimedes Parallel Lead 6'	£4
IBM/Archimedes Parallel Lead 5 metres	£10
IBM/Archimedes Parallel Lead 10 metres	£15
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
MSX Centronics Parallel Lead 4'	£12
RS232 Leads (Various)	P.O.A.
IBM Keyboard extension lead coiled	£5

Concept Keyboards

Standard A3 Keyboard with BBC Software	£143
Standard A4 Keyboard with BBC Software	£117
Archi A3 Keyboard	£144
Archi A4 Keyboard	£118

Plotters

• HP7440A	£415	• HP7475A	£592
Roland Plotters			
• DXY1100	£495	• DXY1200	£625
• DXY1300	£825	• DXY2500	£2345
• DXY3500	£2955	• Sketchmate	£310
• Roland plotter Pens, Fibre tip			£7.50

Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
• 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£21
• 1,000 Sheets 15" x 11" Fanfold Paper	£9
• 2,000 Sheets 15" x 11" Fanfold Paper	£16
• 1,000 Sheets true A4 Fanfold Paper 70gms	£11
• 2,000 Sheets true A4 Fanfold Paper 70gms	£21
• Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£6.00
1,000 90 x 36mm (Twin Row)	£6.25
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.75

Laser Printer Labels on A4 Sheets

3750 70 x 29mm (3 Rows)	£13.50
3000 70 x 37mm (3 Rows)	£13.25
2625 70 x 42mm (3 Rows)	£13.00

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC Micro	—	£3.50
BBC Master	—	£4.00
Archimedes Micro pair	—	£9.00
Citizen 120D	£2.75	£4.50
DMP2000	£2.75	£4.75
DMP4000	£3.75	£4.85
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	—
FX/MX/RX100/1000	£3.95	—
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£4.00	—
LX80/86/800/850	£2.75	£4.50
LX400	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£3.25	£4.75
Panasonic KX-P1124	£7.00	£5.00
Star LC24-10	£2.95	£6.00
Olivetti Ink Jet		
Cartridges (set of 4)	£6	

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595	£6
P115 for KX-P1180	£7
P145 for KX-P1124	£7
P140 for KX-P1540	£8
P155 for KX-P1624	£8
Colour Ribbons for KX-P1081, 1592 & 1595	
Brown, Blue or Red	£9 each

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments (ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)
132 Column version £29 (carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£10	£11
• 3 to 1	£13	£14
• 4 to 1	£16	£17

Professional Type

Connects	Serial	Parallel
• 2 to 1	£17	£18
• 3 to 1	£22	£25
• 5 to 1	£34	£38

Cables extra at £6 each

2 Way Compact Printer Switch

A handy 2 way printer switch can be attached to the micro or monitor for ease of use.

• Centronics £18; • Serial £17
(Cables extra at £6 each)

Auto Printer Sharer Switch

Connects	Serial	Parallel
2 to 1	£40	£45
4 to 1	£62	£49
8 to 1	—	£89

256k Multi Spooler

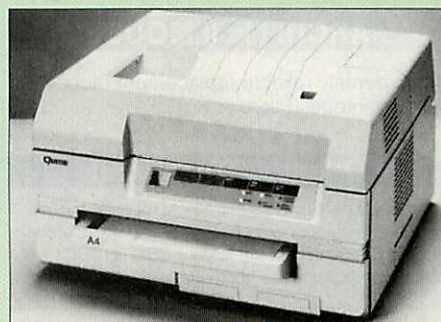
These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 2 In/2 out	£135	• 4 In/2 out	£169
• 8 In/1 out	£199		

Compact Converter Units

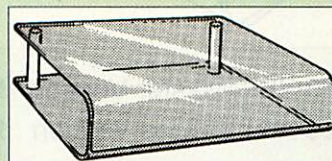
Serial to Parallel	£36	Parallel to Serial	£37
--------------------	-----	--------------------	-----

Laser Direct



• Laser Direct Qume 6ppm complete	£769
• Special High Res Card 600 DPI for Canon LPB 4 & LPB 8 Laser Printers	£325
• LPB 4 Printer plus High Res Card	£899
• LPB 8 III Printer plus High Res Card	£1299

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	£16 (carr £3)
136 Column version	£20 (carr £4)

Continued → → → → → → → → →



- Quest Mouse III & Quest Paint **£59**
 - Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont **£89**
 - Quest Mouse III only **£30**
 - Quest Paint Software only **£34**
 - Quest Font Disc (22 Text Fonts) **£15**
 - Quest Mouse Mat (Red or Blue or Green please specify) **£3**
 - Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer **£18**
- (P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software



Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

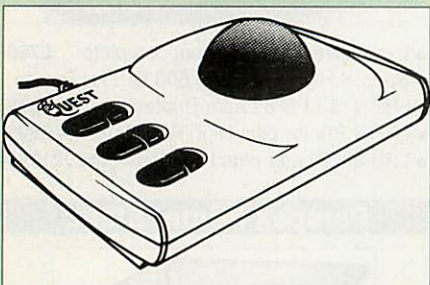
- ConQuest ROM Package **£30****
- (Price includes software in ROM and a comprehensive Manual).
- (Not Compatible with BBC Compact)

ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro **£32**

Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



- QT-10 BBC/Master Version **£25****
- QT-20 Archimedes Version **£26****

RB2 Marconi TRACKER BALL

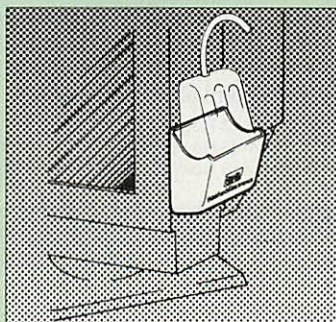
- RB2 (AMX/Quest compatible) **£36**
- RB2 including Quest Paint **£69**
- RB2-A for Archimedes **£37**

THE NEW Mk III AMX MOUSE

- **AMX Mouse plus Super Art **£54****
- (Please specify for BBC, Master or Compact)

- AMX MOUSE ONLY **£29**
- AMX SUPERART Package **£29**
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse **£25**
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker **£13**
- AMX DESIGN (ROM) **£34**
- AMX XAM Educational **£15**
- AMX EXTRA EXTRA **£16**
- AMX MAX A gem of desktop (ROM) **£20**
- MOUSE MAT **£3**

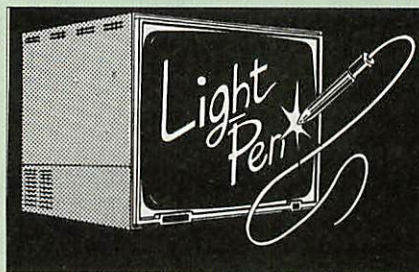
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk.

It protects it from damage when not in use, yet within easy reach when you need it again. At £4 it does not cost a rodent's ransom.

Price £3



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £19

Fleet Street Editor

- Software pack for BBC Compact **£22**
- Fonts N Graphics Disc Utility **£13**
- XTRA Admin **£12**
- Walt Disney **£12**

BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

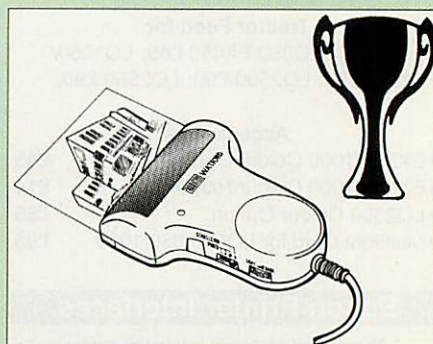
£99

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

Beeb Hand Scanner

Hand-held Scanner for the BBC Micro

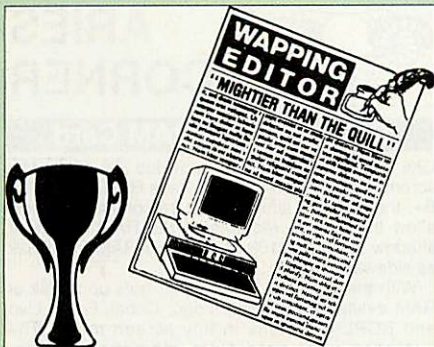


Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer.

The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware **£125**



Winner of the BBC Acorn User 1990
Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, ellipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be - it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack £59
Wapping Editor plus Mouse £79

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages layed out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor. Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines. Supplied complete with instructions.

£12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only).

£13

Archi A4 Scanner



This most advanced Archi A4 image scanner is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the !HELP application on the Acorn applications discs.

The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.

Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.

Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

New Low Prices:

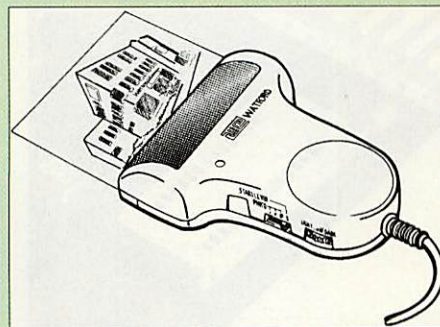
Archi A4 Scanner	£349
Sheet Feeder for above	£95
Scanner + Sheet Feeder	£419

(Dealers Inquiry welcome)

Computer Concept Scanlight

• Scan-Light A4	£375
• Scan-Light A4 + Sheet Feeder	£475
• Scan-Light Junior mono	£178
• Scan-Light Junior 256	£215

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £149. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

SCANNER

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (podule) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

SCANNER SOFTWARE

Full use is made of the windowing and the multi-tasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are:

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting.

X and Y flip.

Edge detection which turns solid objects into outlines.

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

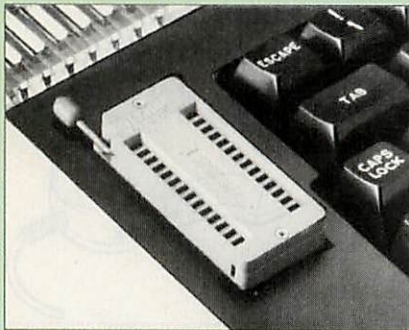
Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

AHS-4 Archi 300/400 Version	£149
AHS-3 Archi A3000 Version	£169

Continued → → → → → → → → → →

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.
- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)
- BBC, B and B+ compatible.

ONLY £18

BBC B Low Profile Cartridge System

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

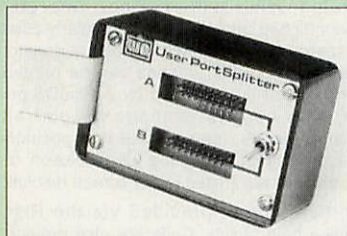
- Complete System **£11**
- Spare Cartridges **£2.75**
- Spare Rack **£1.65**

ROM Cartridges for the BBC Master

Will also accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£8**; Quad **£13**

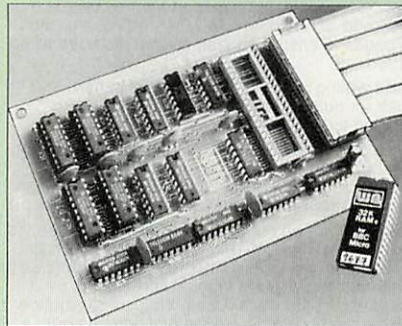
User Port Splitter Unit



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at £22

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

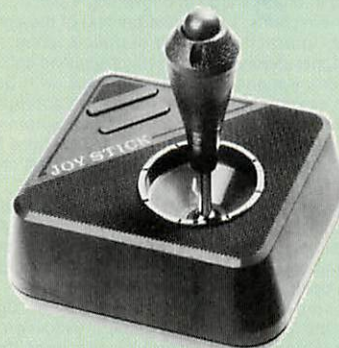
- While word processing, you don't wait for a slow printer, type in text while printing and save on expensive printer buffers.
- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.
- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.
- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.
- Use the full 32k or the bottom 12K of the expansion RAM as a printer Buffer. (P.S. Only 12K printer buffer can be used with Wordwise & WW+, due to the way they are written).
- Unique facility to turn ROMs off and on again.

Only £54

(Price includes a comprehensive manual and the ROM)



Commander Joystick

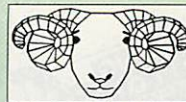


Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

Features:

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15



ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved *FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on your BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

- Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: £59

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price: Aries B-12 **£36**
Aries B-12C **£5**

Aries B-488 IEEE-488 Interface Unit

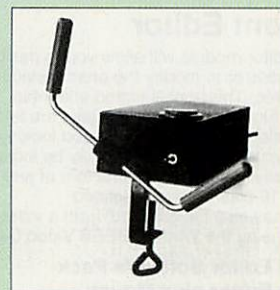
The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238

Voltmace Joysticks

- Delta 3B Single Joystick **£10**
- Delta 3B Twin Joysticks **£15**
- Delta 3C Joystick for Compact **£10**
- Delta 14B Single Joystick **£11**
- Delta 14B/1 Adaptor Module **£12**
- Transfer Software Disc-Tape **£7**
- Delta-Cat A mouse eliminator Joystick for the Archimedes **£24**

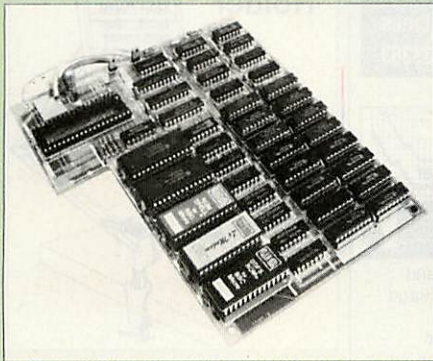
Delta Base B



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

£25

ROM/RAM Card



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 9 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, Watford's ROM/RAM card.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

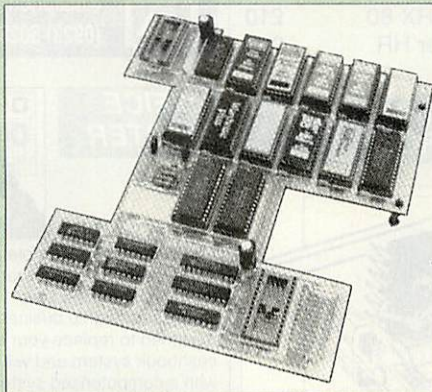
PRICES:

- ROM/RAM card with 32k DRAM £45
- ROM/RAM card with 64k DRAM £59
- ROM/RAM card with a massive 128k DRAM £99

OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit £8
- 16k DRAM for Upgrade £13
- Battery backup £3
- Read and Write protect switches £2 each
- Complete ROM-RAM card with all options fitted £109

Solderless Sideways ROM Socket Board



The key features of this no fuss, easy to install card are:

- Increases your BBC Micro's ROM capacity from 4 to 16.
- No soldering required.
- Very low power consumption.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £35

Battery Backup fitted £39

Battery Backup only £3

16K Sideways RAM £8

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

BBC Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs £20.00
- Maths with a Story 2 (Disc). 4 further maths programs. £20.00
- Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs. £17.00
- ECOLOGY O-Level program. £20.00
- POLYMERS O-Level program. £20.00
- Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule. £20.00
- ADVANCED TELETXT SYSTEM £8.65
- PERIOD TABLE SOFTWARE £20.00
- Computers at Work - Primary £17.35
- Electric Fields 6-14 years £11.25
- Espana Viva - 3 Discs £19.95
- WHITE KNIGHT Chess game £16.00
- A Vous La France £29.00
- FUN SCHOOL 2 - Red: Under 6 yrs £12.00
- FUN SCHOOL 2 - Green: 6-8 yrs £12.25
- FUN SCHOOL 2 - Blue: 8 yrs+ £12.50
- FUN SCHOOL 3 - Red £18.50
- FUN SCHOOL 3 - Green £18.50
- FUN SCHOOL 3 - Blue £18.50
- Six French Games - Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+ £26
- More French Games - Another 6 games 12 years+ £26
- Au Restaurant and Accident de Route 12 years+ £26
- Boulogne and Oh-Les - 2 programs for beginners £26

- Letters to French Penpals - 11 years+ £26
- French Programs with Henri Beret - The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games. 11-16 £22
- Six German Games - Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+ £22
- More German Games - Aimed at pupils in their 2nd year of learning German. 12 years+ £22
- The Cloze Program - Using context clues to predict is much more than a gap filling exercise. All ages £26
- An Introduction to Electronics - Brings together all the basic electronics required for a GCSE Physics or CDT course. 14-16 years £26
- Computer Control - This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years £26
- The Nuclear Reactor - An interactive, menu driven program for GCSE pupils. Demonstrates & explains nuclear fission & the chain reaction. 14-16 years £22
- PUNCMAN Learning punctuation
Puncman 1 & 2 for 7 - 13 years £15
Puncman 3 & 4 for 8 - 14 years £15
Puncman 5 & 6 for 8 - 15 years £15
- Yes Chancellor - A chance to take over number 11 at Downing Street. 12 years+ £18
- Letters & Pictures - Introduces phonic skills to Infants 6-8 years £15
- Numbers & Pictures - Early number learning is a great fun (4-6 years) £15
- Note Invaders - Budding musicians can learn the notes on the Clef with this elegant game 3 programs (7 to Adults) £15
- Maps & landscapes No. 1 (9-14 years) £18
- Help Your Child learn Basic Map work No. 2 (9-14 years) £18
- Pirate - Educational Adventure (8-14 years) £15
- Spelling Week by Week (6-14 years) £18

Archimedes Software

- Animated Alphabet (3-6 yrs) £21
- Arcventure (8-12 yrs) £29
- Bookbinder £43
- Bumper Disc £14
- Bumper Disc 2 £14
- Craftshop 1 £26
- Craftshop 2 £26
- Christmas Allsorts - Clip Art (6-16 yrs) £16
- Convert-Key £16
- Data Word £16
- Desktop Stories £35
- DigiSim £35
- Dream Time (5-7 yrs) £23
- Drooom £19
- Farm (5-7 yrs) £19
- Fleet Street Phantom (9-13 yrs) £25
- Fun School 2A Red (up to 6 years) £12
- Fun School 2A Green (6-8 years) £14
- Fun School 2A Blue (8 years+) £14
- Gate Array Teaching System £68
- Glimpse Clip Art Utility (7-16 yrs) £8
- Highlighter (6-16 yrs) £42
- Jiglet £27
- Jigsaw £28
- Mapventure (9-13 yrs) £24
- Microbugs £24
- Money Matters £16
- Nature Park Adventure (7-9 yrs) £27
- Numerator £60
- Picture Book £16
- Recall (6-13 yrs) £39
- Sellardore Tales £24
- Snippet £26
- Space Mission Mada (9-13 yrs) -
- Sting of the Dump (9-13 yrs) £22
- Target Maths £16
- Viewpoints (9-12 yrs) £33
- Wizard's Revenge (7-10 yrs) £17
- Worst Witch (7-10 yrs) £25



CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383

Continued → → → → → → → → →

Computer Concept's ROMS

Communicator	£49
Disc Doctor	£18
Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42
Wordwise	£24

Wordwise plus

£40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear test-segment area.
- BBC B, B+ and Master compatible.

Only £24

(N.B. Word Aid requires a Disc interface in your Micro)

Acorn ROMS

View 3.0 ROM	£45
Viewsheets (Acornsoft)	£36
Viewstore	£36
Viewspell with 80 track disc	£25
Viewplot Disc	£20
(Please specify for Master 128 or Compact)	
View-Index	£12
Overview packs 1 & 2	£65
Hi-View	£38

MINI OFFICE II

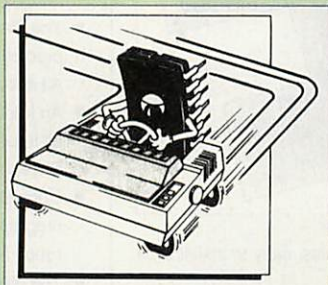
DISC Version for BBC B & B+	£14.00
DISC Version for BBC Master	£16.00
DISC Version for the Compact	£18.00

(When ordering please specify for which Micro & 40 or 80 track Disc)

View Printer Driver Discs

Epson FX & RX 80	£10
Juki & Brother HR	£10

View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, Hi80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redefinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute ★ command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips.

Price: Only £29



CREDIT CARD
24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

OFFICE MASTER



CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

FINAL ACCOUNTS – Will take data prepared by the Cashbook module and produce a complete set of accounts as following: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques.

EASILEDGER – A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS – Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL – Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only £21 (Disc)

OFFICE MATE



- DATABASE
- BEEBCALC SPREADSHEET
- BEEBLOT GRAPHICS

DATABASE – Set up a computerised card index system with powerful search facilities.

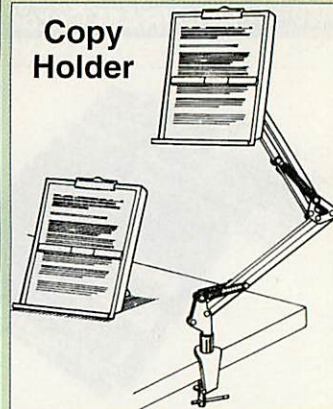
SPREADSHEET – Offers many calculation and editing features

BEEBLOT – Provides visual representation from Spreadsheet data.

Only £10 (Disc)

Acorn Speech Synthesizer package complete, for the BBC B Microcomputer
Special Offer £14

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top £8 (carr. £3)
Angle poise £12 (carr. £3)

The Epson RX/FX/KAGA Printer Commands Revealed Handbook

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

£5.95 (No VAT)

ALL PRICES EXCLUDE VAT

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£6.95
15 Hr Wordprocessing BBC/WW+ WW+	£6.95
30 Hour BASIC (BBC Micro)	£12.95
1st Word Plus Rel. 2 Manual	£10.00
A3000 Technical Reference Manual	£29.00
Acorn DTP A Guide to	£17.00
Advanced User Guide for BBC	£10.95
Archimedes 1st Step – Beginners Guide	£9.95
Archimedes Assembly Language	£14.95
Archimedes BBC Basic Guide	£20
Archimedes DTP Manual	£10.00
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers Reference Manual	£79.00
Assembly Language Quick Ref.	£21.95
BASIC 2 – User Guide	£2
Basic V – A Dabhand Guide	£9.95
BBC Basic Guide (Archimedes)	£19.95
BBC Micro – Within the	£11.95
BCPL User Guide	£9
C Big Red Book of	£8.95
C – A Dabhand Guide to	£14.95
C Programming Lang. 2nd Edition	£24.95
COMAL – Introduction to	£9.50
Deutsch Direkt! (Book only)	£5.95
DISC FILING SYSTEM (DFS)	
Operating Manual for BBC	£6.95
FORTH on the BBC Micro	£9.95
ISO-PASCAL Reference Manual	£9.95
Master 512 Guide – Dabs Press	£9.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14
Master Reference Manual Part 2	£14
Master Reference Manual – Advanced	£17
MINI OFFICE II – A Dabhand Guide	£9.95
Mouse User Guide to BBC Micro – the Complete	£5.95
Example Programs on Disc for above	£4.95
PASCAL Programming	£10.95
Risc OS Style Guide	£9.95
RISC Technical Manual 260 pg	£14.95
The Epson FX-KAGA PRINTER	
Commands REVEALED	£5.95
Understanding Interword – A Beginners Guide	£4.95
View 3.0 User Guide	£10
View Guide (View 2.1)	£5.00
View, Viewsheets & Viewstore – Mastering	£12.95
Viewsheets & Viewstore Dabhand Guide	£12.95
VIEW Dabhand Guide	£12.95
Viewsheets User Guide	£10
Viewstore User Guide	£10
Z88 – A Dabhand Guide	£14.95
Z88 Computing	£9.95
Z88 Magic	£14.95

BOOKS for IBM PC & Compatibles

1-2-3 For Business	£25.95
1-2-3 Mastering Release 3	£22.95
1-2-3 Mastering – 2nd Ed.	£20.95
1-2-3 Quick Reference	£8.45
1-2-3 Using – Rel. 3	£25.95
8086/8088 Ass. Language Quick Ref	£8.45
8086/8088 Programming the	£17.95
Accountancy software in Business – Using	£14.95
Agenda – Using	£21.95
Aldus Pagemaker	£27.95
Aldus PageMaker – Using	£21.45
Amstrad 9512 – Using the	£10.95
Amstrad Basic 2 User Guide	£9.95
Assembly Language Quick Ref	£8.45
Autocad 4th Ed – Mastering	£31.50
Autocad – Mastering Through Rel. 10	£28.95
Autocad – Inside Release 11	£32.45
Autocad – Inside 6th Ed	£36.95
Autocad – Mastering Through Rel II	£28.95
C Introducing	£12.95
C Programming Language 2nd Ed	£26.95
C – Teach Yourself	£19.95
Clipper – Using 2nd Ed	£22.95
Computer Users Dictionary	£9.95
Corel Draw 2nd Ed Mastering	£25.50

Corel Draw Quick Ref Thro V1.2	£7.95
Corel Draw made easy	£24.95
Corel Draw v2 Quick Ref	£8.45
dBase 3/4 Complete Ref	£27.45
dBase III Plus – Complete Reference	£19.95
dBase III Plus Handbook 2nd Edition	£22.95
dBase Instant Reference (III & III+)	£10.95
dBase IV – Handbook	£21.95
Desk Jet Unlimited	£19.95
DOS & BIOS Function – Quick Ref Guide	£7.95
DOS Instant Ref.	£9.75
DOS Instant Reference (up to 3.3)	£6.95
DOS Power Tools	£46.45
DOS – Programmers Ref. Manual 2nd Ed	£25.95
Excel for Windows – Quick Ref.	£8.95
Fax – Management with	£7.95
FAX – Managing with	£12.95
Framework III – Mastering	£24.50
GW Basic Users Guide & Ref	£12.95
Hard Disc Instant Ref	£10.95
Hard Disc management – Quick Reference Guide to	£4.95
Hard Disc – Using Your	£27.45
IBM PC & PS/2 – Inside the 3rd Ed	£21.70
Microsoft GW BASIC	£17.95
Microsoft Windows 3 – Using 2nd Ed	£20.95
Microsoft Windows Illustrated	£21.95
Microsoft Word 5.5 – Using	£20.45
MS-DOS – ABC's of 2nd Ed.	£17.95
MS-DOS Bible 3rd Edition	£24.95
MS-DOS First Book	£15.50
MS DOS for Beginners	£17.45
MS-DOS Quick Ref Guide 5	£8.95
MS-DOS – Running 4th edition	£19.95
MS-DOS – Supercharging 2nd Edition	£17.95
MS-DOS Users Guide 3rd Edition	£27.95
MS-DOS – Using	£21.95
MS-DOS 5 – Quick Start	£18.45
MS-DOS 5 User Hand Book	£19.95
MS-DOS 5 – Upgrading to	£14.95
MS-DOS 5 Using	£29.95
MS-DOS Tricks & Tips	£16.45
Netware User Guide	£23.95
Networking Personal Computers 3rd Ed.	£20.95
Norton Utilities – Inside the	£22.95
Novell Network – Mastering	£27.95
Novell Network – The ABC of	£21.95
Novell Network – Using	£27.45
PageMaker on IBM PC – Using	£22.95
PageMaker – Using	£22.95
PCs & Compatible Computers for Beginners	£14.95
PC Crash Course 2.0 2nd Edition	£19.95
PC Tools – Quick Ref	£8.45
Programming Guide to EGA & VGA Cards	£25.95
Quattro – Mastering Pro 3	£21.95
Quattro Pro III – Using	£25.95
Quattro Pro Quick Ref.	£8.45
Smart – Using	£21.45
Smartware II – Mastering	£22.95
Smartware II – Using	£27.45
Smart, tips, tricks and traps (QUE)	£22.95
Supercalc 5 – Using	£27.45
Supercalc Professional	£17.95
Symphony Made Easy	£19.95
Symphony – Using Special Ed.	£27.45
Symphony 4th Edition – Mastering	£24.95
Turbo C Bible	£27.95
Turbo C++	£22.95
Turbo Pascal 5 – Using	£22.95
Turbo Pascal Using	£27.45
Unix – Using	£27.45
Upgrading & Repairing PC's	£27.45
Ventura Mastering – 2nd Ed.	£22.95
Ventura Publisher – Using	£22.95
Ventura – Instant Reference	£10.95
Ventura – 3rd Edition	£24.95
Window Programming 2nd Ed	£27.95
Window 3.0 Programming	£27.95
Window 3.0 Quick Ref.	£7.95
Word for Windows made easy	£15.95
WORD for Windows – Using	£22.95
Wordperfect 5 – Using	£22.95
Wordperfect – Quick Reference V5	£8.45
Wordperfect 5.1 – ABC's of	£18.95
Wordperfect 5.1 – 1st Book of	£15.50
Wordperfect 5.1 – Mastering	£24.95
Wordperfect 5.1 Quick Start	£18.45
Wordperfect 5.1 – Using Special Ed	£25.95
Wordperfect for Beginners	£17.45
Wordstar & CPM Made Easy	£15.75
Wordstar Using 5.5 & 6 3rd Ed	£25.95
Wordstar 6.0 Made Easy	£15.95

Carriage on Books vary between £2 to £4.00, depending on their weight

New Release ACORN TO PC

Stop the Confusion!

Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes and the BBC A3000) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quickly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way – from Acorn to MS-DOS, or from MS-DOS to Acorn. 'ACORN TO PC' also acts as a handy reference guide to all Acorn star commands and their MS-DOS equivalents. It also has an extensive and readable explanation of the directory tree and hierarchical filing systems in general. Both DFS and ADFS Acorn systems are covered. 'ACORN TO PC' is written clearly and concisely by Dr. John Lockley, who has wide experience of writing and broadcasting. He is currently appearing as a regular contributor on Radio 5, and is co-author of 'The Complete BBC Computer User Handbook'.

Price: £12.95 (No VAT)

The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you. The general style and level of presentation means that both the expert and beginner alike will feel comfortable with the quality and quantity of the material. Subjects covered include the general use of computers, hardware design and peripheral devices like printers, disc drives, etc, and Networking. Programming hints and tips and various disciplines for making a better program are discussed in some detail, including debugging of specific errors. Standard programs are covered, such as wordprocessors, spreadsheets, databases, graphics, communications, etc., which brings you neatly on to the subject of using computers in the office or at work – even giving advice on writing and marketing your own programs. A book you will enjoy to use as a reference, or read from cover to cover, over and over.

Only: £14.95 (No VAT)

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

Beeb PC (BASIC)

Beeb PC Basic is designed for program authors wishing to convert programs so that they will run on IBM personal computers. To convert BBC BASIC programs manually can waste days of valuable time with every occurrence of common statements such as PROC, DEFPROC, TAB, having to be changed.

Beeb PC (BASIC) automates many of these changes, and will convert majority of BBC statements that are invalid for IBM BASIC into equivalent acceptable statements. In addition BBC BASIC data files can be converted to IBM BASIC format, with support provided for all BBC data formats: - INTEGER, REAL & STRING.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

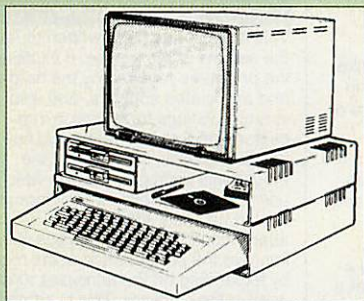
Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual. (Will only work on 360K Disk Drives & read only ADFS and Watford DDFS – not DFS).

Price: £39

(Please write in for technical literature)

Continued → → → → →

Plinths for the BBC B & Master 128K Micros

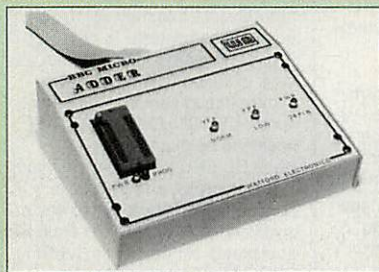


Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	£13
Double BBC Plinth	420 x 310 x 210mm	£24
Single Master Plinth	490 x 310 x 105mm	£14
Double Master Plinth	490 x 310 x 210mm	£26

(Carr. Single plinth £2; double plinth £3)

ADDER



The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.

Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: 2516, 2716, 2532, 2732, 2764, 27128, & 27256.

£55 (£5 Carr)

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER EB** - Standard version erases up to 16 chips. **£34**
- **ERASER GT** - Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£36**
- Spare UV tubes. **£12**



CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Servisol Foam Cleaner

This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces.

£2.50

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

£2.50

Aerosol Dust Spray

Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces.

£3

Spares for BBC Micro

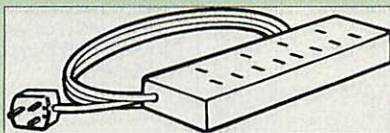
UHF Modulator	£4	16MHz Crystal	£2
Speaker Grill	£1	17.734 MHz Xtal	£2
Speaker	£3	32.768MHz Xtal	£1
Keyswitch	£1.50	BBC B Refurbish	
Master PSU	£59	Casing	£25
Master Keyboard	£62	Keyboard	£46
Master Casing	£49	Power Supply	£59
Replacement Flexible 17 way Keyboard Connector			£4

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage transient spikes/surges caused by lightning or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

£2

Metal Chip Extractor **£3**

28pin DIL Header Plug

SOLDER type **£1.50** IDC CRIMP type **£1.95**

8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only **£1.00**

28 pin ZIF SOCKET (Textool) **£6.95**

Connecting Leads

(All ready made and tested)

CASSETTE LEADS 7 pin DIN Plug	
to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
to 3 Jack Plugs	£2.50
6 pin DIN to 6 pin DIN Plug (RGB)	£3.00

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00**; Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

	Plugs	Sockets
RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
ECONET (5 pin DIN)	35p	50p
Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	-
6 way Power Connector	120p	150p

Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

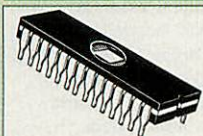
Watford POWER DUCK

£8

CHIP SHOP

1 MB-10 DIL D-RAM	£4.50
1 MB ZIP D-RAM	£4.90
256K x 4-8 DIP	£4.75
256K x 4-8 ZIP	£4.80
DS3691	£4.50
DS88LS120	£5.25
LM324	£0.45
SN76489	£5.50
SAAS050	£8.75
UPD7002	£6.00
2764-250nS	£3.00
27128A-250nS (12V5)	£2.50
27128-250nS (21V)	£4.00
27256-2	£3.00
27512-2	£4.50
27C101G (1 Meg)	£7.00
4013	75p
4020	£1.00
4164-10	£1.55
4464-10	£3.50
4816 RAM	£2.00
41256-8	£2.00
41256-10	£1.50
6264LP-8K	£4.00
6502A CPU	£5.00
65C02 3M	£9.75
65C12	£9.00
6512A	£10.00
6522	£4.00
6522A	£5.00
62256ALS-15	£10.00
62256P-12	£8.50
6818	£4.00
6845SP	£6.00
68B50	£2.95
68B54	£7.50
7438	50p
74LS00	50p
74LS04	50p
74LS10	50p
74LS123	£1.00
74LS163	£1.00
74LS244	£1.00
74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	£1.00
75159	£3.00
9637	£2.00
ICL7673PA	£3.00

Assorted ROMS



ACORN ADFS	£25
ACORN BASIC 2 plus	
User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
Acorn Graphics	£25
Acornsoft C Disc	£36
Acorn LISP	£19
Acorn OS B+	£25
Acorn OS 1.2	£14
Basic Editor	£24
BBC PCB Designer	£49
Beebmon	£22
Buffer & Backup	£20
Communicator	£49
Dump Out 3	£25
EPSON NLQ ROM	£25
Graphics Extension Rom	
GXR-B	£21
GXR-B+	£22
ICON Master	£28
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Micro Prolog	£25
Microtext Disc	£46
Microtext Rom	£199
NLQ DESIGNER	£25
Numerator - Archi	£69
Numerator - BBC	£39
Pendown ROM	£32
Rom Manager	£20
ROMIT	£29
SERIAL ULA	£13
TED	£35
Termulator B, B+	£28
Termulator Master	£32
Video ULA	£14
ULTRACALC II	£26
1Mb OS ROM	£39

Hi-Speed, Low Cost Archi Hard Disc Drive

Watford's NEW Innovative IDE interface card brings the latest advances in PC hard disc technology to within reach of the Archimedes user. Because of the integration of the controller and drive electronics onto one compact board, Watford Electronics have been able to include extra features into the drive, such as Caching, where tracks are buffered in fast memory, reducing access times and increasing throughput. All these benefits make IDE drives far more attractive than conventional ST506 drives or SCSI.

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the !Fonts application.

A powerful security feature has been provided with the two unique commands *IDELOCK and *IDEUNLOCK, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELOCK as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Built in Non Volatile RAM to hold configuration
- LED activity indicator
- 37 way D type socket for external drives
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

*Commands

*IDELOCK
*IDEUNLOCK
!IDEFS

Selects the IDE filing system 'IDEFS'.

*IDEDrives

Displays the configuration and native characteristics of installed drives.

*Configure IDEFSDirCache

*Configure IDEFSBuffers

*Configure IDEFSDrive

Typical transfer speeds

Prairie Tek 20Mb 650K bytes per second
Seagate 43Mb 800K bytes per second

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£249
ADA 0530	100Mb	16mS	£379
ADA 0570	200Mb	15mS	£499
ADA 0580	330Mb	15mS	£895

All the above 3.5" hard drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting). For use with A3000/A4000/A500 series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for A3000 £85

Internal Hard Disc Drives for A3000

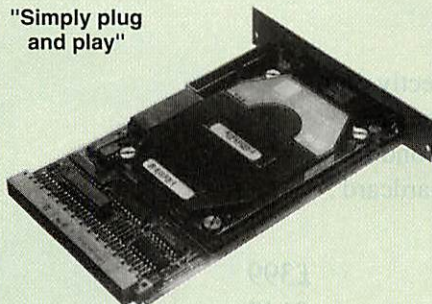
State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0700	21Mb	23mS	£185
ADA 0720	44Mb	19mS	£385
ADA 0750	60Mb	18mS	£425
ADA 0730	89Mb	18mS	£685

Supplied ready assembled. No soldering required. Simply plug into the allotted space.

Archi IDE Hard Cards

"Simply plug
and play"



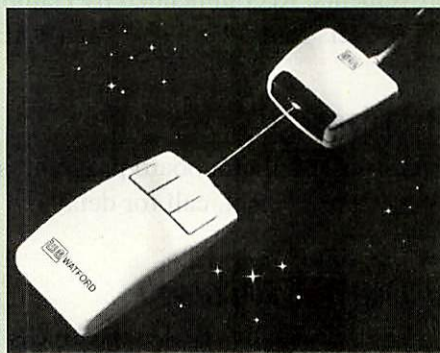
Watford's NEW low cost, high performance revolutionary IDE Hard Cards for the A3000 and A400 series Archimedes are unbelievably easy to install – you simply slot one into any vacant podule backplane slot in the rear of your computer. These stunningly engineered, light weight but fast, 2.5" miniature hard drives are mounted onto the professionally designed cards, and are supplied with the fully Acorn-conformant IDE Filing System ready installed and ready to run. A novel feature of the hard cards is that they can be easily removed and transported to another Archimedes, for example to make a hard disc backup, or to transfer saved files from work to home etc. Security of files on the hard disc is ensured by our unique security password lock, which allows files to be read only, but not overwritten or deleted – ideal for use in school applications where the integrity of your master software needs to be retained.

ADA 0650	21Mb	23mS	£199
ADA 0660	44Mb	28mS	£375
ADA 0670	89Mb	18mS	£675

(Can be used as a Removable Hard Drive)

NEW

Archimedes Cordless Mouse



Ever found that using a mouse on a busy desktop has its problems? The cable is always being caught up in papers, tangled round equipment and other cables etc, and what about that cup of coffee spilled over your work!

Watford Electronics' new Cordless Mouse solves these problems by removing the cause for concern - replacing the cable with a simple infra red link. It still provides all the speed and easy control of a conventional mouse, but with complete freedom. In use, there are no operating differences between the standard mouse and the new cordless mouse so all mouse functions and mouse driven RISC software will be fully compatible. Pinpoint accuracy is ensured by a unique Accelerator button, which, when pressed, moves the pointer by just a tiny amount for a large slow movement of the mouse, but by a large amount for a quick wizz of the mouse.

Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
- Auto Power Shut-Down after 20 seconds inactive

Price £59

Watford Electronics are:

- Acorn Qualified Dealer & Econet Referral Centre
- ARIES PC Dealer/Distributor
- Canon Authorised Printer Dealer
- Cambridge Computer Dealer
- Citizen Printers Special Dealer
- Computer Concept Premier Dealer
- EIZO Monitor Dealer
- Fujitsu Printers Premier Dealer
- Microvitec Appointed Dealer
- NEC Appointed Dealer
- Panasonic Premier Dealer
- Roland Plotter Official Dealer
- Star Printer Premier Dealer
- Taxan Appointed Monitor Dealer
- 3M Media Premier Distributor



Watford Electronics

250 Lower High Street, Watford WD1 2AN, England
Tel: 0923 237774/240588 Fax: (0923) 233642 Telex: 8956095



Prices subject to change without notice and available on request. ALL OFFERS subject to availability. Mail Order and RETAIL SHOP. Trade and Export inquiries welcome. Government and Educational Establishments' OFFICIAL ORDERS Accepted. Shop Hours: 9.00am to 6.00pm, Monday to Saturday. Thursdays 9am to 8pm. (Free Customer's Car Park). VAT: UK customers please add 17.5% VAT to cost incl. Carriage. CARRIAGE: Unless stated otherwise, minimum £3 on all orders. £4 on Larger items. On bulkier items, £7 Securicor charge applies (UK mainland only). Overseas orders, carriage is charged at cost. Specifications of all products are given in good faith but are subject to change without notice. Some items vary in their availability. Watford Electronics Terms and Conditions are available upon request. Please ring for latest delivery situation.

ARCterm 7

£68

This new release of our popular comms package now supports Minitel emulation and has many other improvements. Recommended by Hampshire LEA. Existing users return both disks and SAE for upgrade.

ARCbbs

£85

Our multi-user bulletin board program is under constant development, call for details.

A5000 IDE drives

A5000 drives usually replace the 40MB disk (if fitted) - we pay £60 for displaced 40Mb A5000 drives. To fit an additional drive in the second floppy slot and keep the 40Mb internal, add £10 for new cable set. Typical transfer rates are 800k/second for 100Mb and 900k/second for 200Mb. Drives have a 2-year guarantee.

A5000 internal 100Mb 17/9ms Quantum	£279
A5000 internal 200Mb 17/9ms Quantum	£449

IDE

Our IDE cards can have 2.5" drives fitted directly onto the card, making them 'hardcards'. Typical transfer rates are 700k/second for 40Mb and 900k/second for 100Mb. Drives are 3.5" unless specified as 'hardcard'.

A3000 internal 40Mb hardcard	£399
A300/400 internal 20Mb 25ms Conner	£149
A300/400 internal 40Mb 28ms cached Seagate	£259
A300/400 internal 100Mb 17ms cached Seagate	£329

SCSI

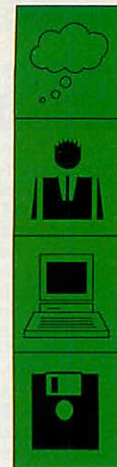
We supply 16-bit Morley cards which are the fastest on the market (cached card can sustain over 3.5Mb/sec, normal card over 2Mb/sec). Typical transfer rates are 1000k/second for 50/100Mb and 2000k/second for 492Mb. All drives are cached and have 2 year guarantees. Systems labelled (cc) come with a cached SCSI card at no extra cost, otherwise add £50 if you require one.

A3000 external 50Mb 17/9ms Quantum	£379
A3000 external 100Mb 17/9ms Quantum	£499
A3000 external 200Mb 17/9ms Quantum	£779
A3000 external 492Mb 12ms Fujitsu (cc)	£1499
A300/400 internal 50Mb 17/9ms Quantum	£319
A300/400 internal 100Mb 17/9ms Quantum	£429
A300/400 internal 200Mb 17/9ms Quantum	£699
A300/400 internal 492Mb 12ms Fujitsu (cc)	£1399

All hard disk systems come tested and formatted with all necessary cables. Delivery on hard disks £10.

Please add VAT at 17.5% to all prices. Plastic welcome.

THE SERIAL PORT



The Serial Port
Burcott Manor, Wells,
Somerset, BA5 1NH

Telephone	(0749) 670058
Fax	(0749) 670809
Modem	(0749) 670030



★ INFO

COMPATIBILITY KEY

B	BBC B compatible
B+	BBC B+ compatible
M	Master compatible
C	Master Compact compatible
E	Electron compatible
A	Archimedes compatible
A3000	BBC A3000 compatible

★ **PRIZE £20** ★

GRIDLOCK

B Paul Pibworth of Gloucester has sent in a handy printer utility. It uses graphics mode to print out tables or grids to your own specification. You are asked if the grid is continuous or spaced – the latter means that there are gaps between some, or all, of the vertical columns. If there are gaps you are asked for the start and end points in inches of each horizontal line.

If the table is continuous this is simply the left and right hand edges of the table. Next you must enter the number and position of the vertical and horizontal lines. The table is then printed.

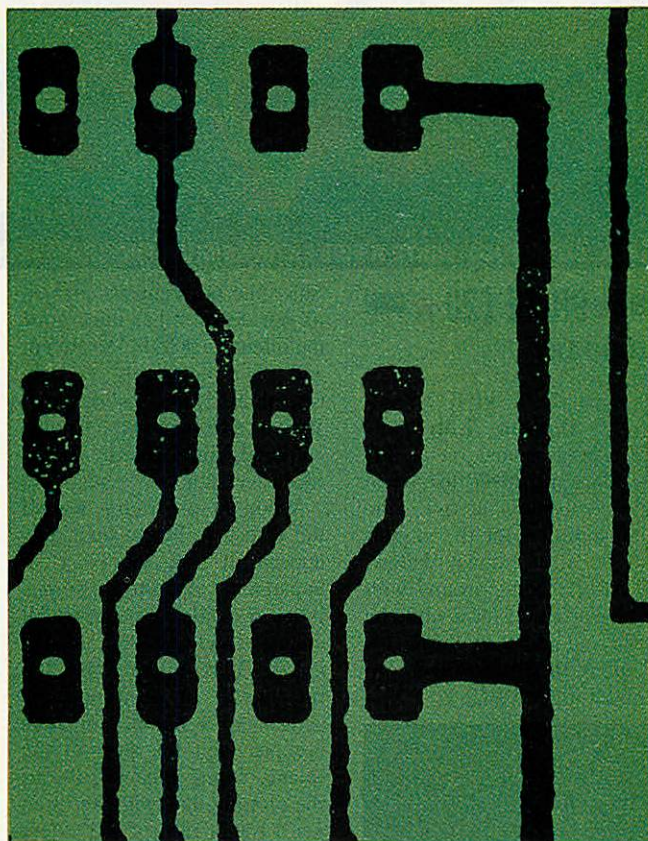
Paul says the program is not truly 'finished' – values out of range are likely to crash the program; inputs are in inches only; there is no load or save option and no Archimedes desktop version. (But isn't that what *Draw* is for? Ed.) Even so, the program is both handy and concise.

★ **PRIZE £20** ★

COUNTER INTELLIGENCE

☐ If you have ever watched a quiz show called *CountDown*, on Channel 4 then this submission from **Michael Rozdoba** is for you. His *Numbers* program solves the *CountDown* 'numbers game'. In this a contestant chooses a total of six unseen numbers from two random selections –

DAVE ACTON and DAVE LAWRENCE
deliver their monthly mix of bits and pieces for your eight and 32-bit machines



★ INFO COMPATIBILITY TABLE

LISTING	NAME	BBC B	MASTER	ELECTRON	ARC
Info 1	GridMaker	★	★	★	★
Info 2	CountDown				★
Info 3	MicroArt32				★
Info 4	MicroArt8	★	★	★	★
Info 5	Fire32				★
Info 6	Fire8	★	★	★	
Info 7	Henon				★
Info 8	Handy32				★
Info 9	Handy8	★	★	★	
Info 10	Predictor	★	★	★	★
Info 11	Bugland				★
Info 12	Spikes32Arc				★

one containing 'large' numbers (25, 50, 75 and 100) and the other small numbers (1 to 10). The *CountDown* computer, affectionately known as Cecil, selects a random target number up to 999.

Both contestants then have 30 seconds to combine as many of the initial numbers as they need with the elementary arithmetic operators (+, -, *, and /) to get as close as possible to the target.

No numbers may be used twice, although not all six need be used. The resident statistician, Carol Vorderman, invariably does better than the contestants, but Michael's program, equally affectionately known as *Richard*, invariably does better still. When run, *Richard* asks for the initial numbers and the target to be entered, so you can play along with the quiz on TV.

Richard works by brute force, although he does exhibit some minor intelligence by trying all possible combinations of the six initial numbers and four arithmetic operators. The process can be thought of as moving up and down the branches of a tree – any particular path from the base of the tree to the tip constitutes a particular combination of the numbers and symbols.

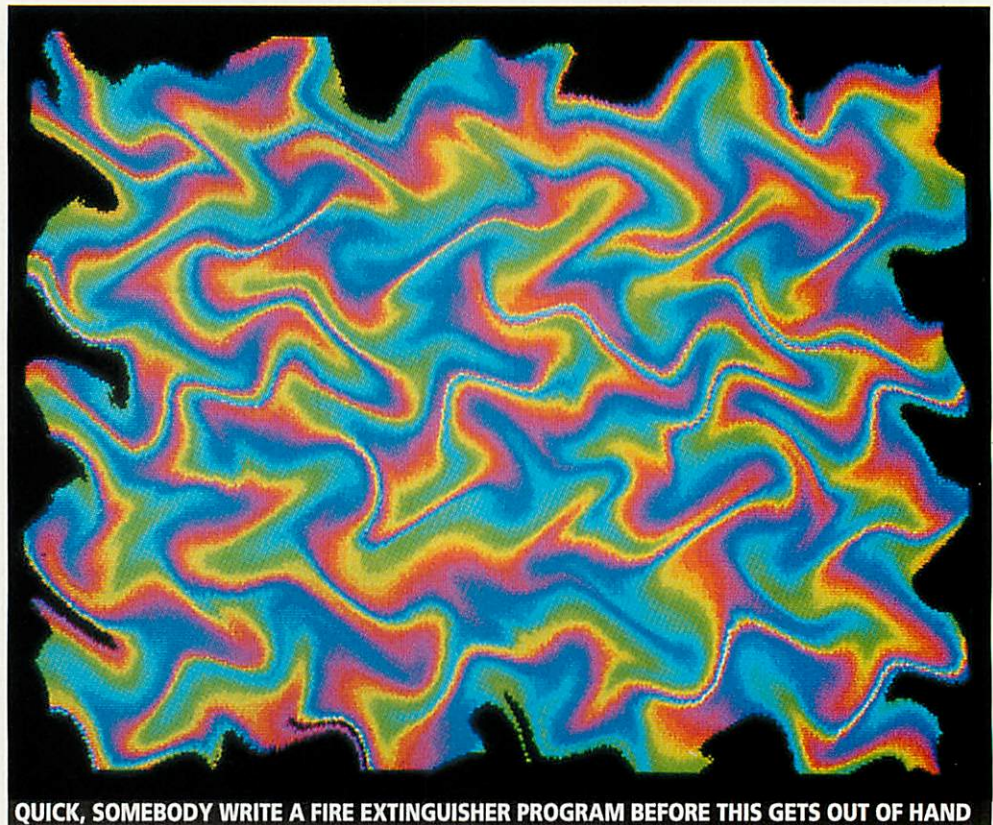
The intelligence comes in when *Richard* prunes certain branches of the tree which he decides are wasteful. For example, if the current calculation yields a negative number the following branch is chopped off. Similarly the operators + and * are only applied if the first operand is greater or equal to the second. This prevents the results being duplicated all the way along two separate branches.

Although *Richard* often takes longer than 30 seconds to check all the possible combinations (on an Arm2 machine at least), it usually seems that when an exact solution exists there are several

other solutions, so *Richard* will invariably find one within the time available. As the program runs it outputs the calculations for the 'best so far' solutions which lie within 10 of the target. If it finds an exact solution it terminates with a report on the time taken. *Richard* can be terminated via SHIFT ESCAPE.

It would be nice to say that if *Richard* cannot find a solution then one does not exist. Michael admits that he's not certain about this, saying: '*Richard* only works with integer numbers, so if a division produces a fractional answer the following branch is pruned off. Although there are some solutions which involve an intermediate fractional calculation, I have never seen a problem where the only solutions which exist require fractions. I don't think this can happen and, if this is true, you can be certain that when *Richard* tells you it can't find an answer, one doesn't exist. However, as yet this conjecture remains unproven and unless you can find an example that proves otherwise, or a bored number theorist who can prove it, it will remain one of the mysteries of mathematics.'

We would like to have carried an eight-bit version of *Numbers*, but the sheer scale of the problem defeated us this month. We are sure that at least one clever reader will be able to provide a Beeb solution – if that reader is you, then we'd be happy to include your

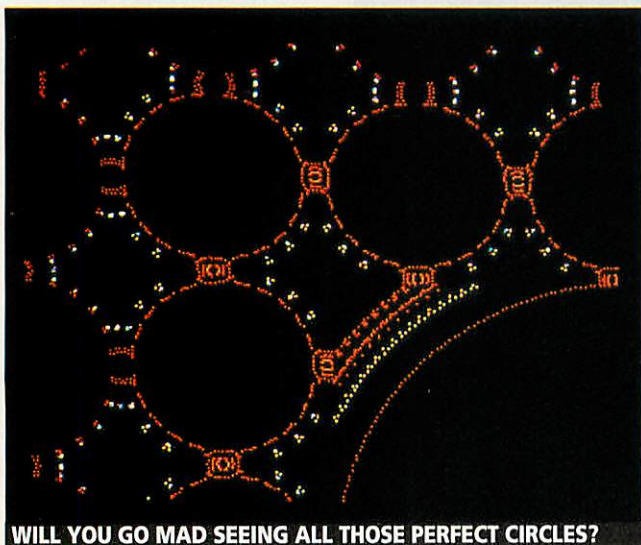


QUICK, SOMEBODY WRITE A FIRE EXTINGUISHER PROGRAM BEFORE THIS GETS OUT OF HAND

★ PRIZE £20 ★

MICROART

Recently, a ★INFO regular **Duncan Lilly** was rooting around on a PC magazine cover disc when he came across the inspiration for the graphical ditty shown below. After playing around with the program for a while he added colour, then threw his PC out of the window and converted it to the BBC.



WILL YOU GO MAD SEEING ALL THOSE PERFECT CIRCLES?

Since the program has arrived on our desks, it has undergone the intensive ★INFO treatment and so it now only vaguely resembles Duncan's original. We've also penned a multi-coloured, multi-palette Archimedes version.

When the program is started the screen is black, then dots appear all over the place in apparently random positions. After a while a pattern will emerge and slowly change colour. It is unlikely that the image will fit neatly on the screen, so a number of keys are provided for shifting the image. Doing this will restart the plotting, but you can often get a rough idea of the extent of the pattern early on and reposition it as necessary.

Cursor keys move the image in the corresponding direction, + and - increase and decrease its size, < and > rotate it. Additionally, SPACE chooses new (random) parameters and starts a new pattern. Two methods are used for determining the colours plotted: by default, plotting a point will increase its brightness (the palette is arranged in brightness order); if you change to cycle (by pressing C) each colour will be

used for a random number of points before moving on to the next colour. Incremental mode can be reselected by pressing I.

The Archimedes version has four built-in palettes. By default a simple black and white one is used which allows you to find a good pattern and position it correctly on the screen. Keys 1-3 select the other palettes – 1 is a 16 shade grey scale, 2 a progression from blue through white to red and 3 a colour spectrum (0 is the black and white one). As with the BBC version you can Increment or Cycle the colours. Extra palettes can easily be added by providing a list of 256-colour mode colour byte values in data statements at the end of the program. Each list is terminated by having two numbers the same, so there is no 'next' colour.

The program is very similar in operation to a one-liner carried in *Risc Revue* many months ago: x and y are initialised to zero, then a couple of functions are iterated on them and the results plotted each time. Most of the program is taken up processing key presses, but it is very simple and very pretty.

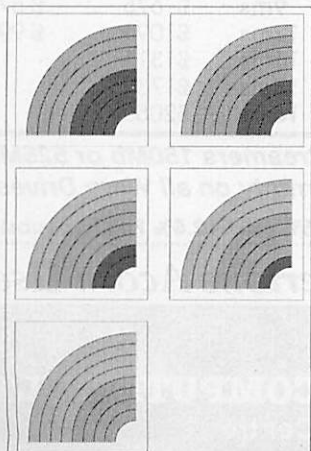
★PRIZE £20★

FIRE-ARM

B You may remember the striking effect produced by the *Gwarp* program (BAU June 1991). Dave Lawrence's original program used Arm code to create the whacky patterns, but **Jan Vibe** has sent us a remarkable piece of Basic (yes, you really can write graphic demos in Basic) which produced the striking result shown on page 50. *Fire32* works by plotting, then distorting, a set of concentric circles.

The distortion takes the form of stretching the rings horizontally or vertically according to a randomly chosen sinusoidal pattern. The Basic command `RECTANGLE FILL TO` is used to move a single column or row of pixels the required amount. Note that horizontal distortion is much quicker than vertical, not only because there are fewer rows than columns, but also because the rectangle move can be done in words rather than bytes of memory. In all, six distortions are applied in each direction and the result is a fiery pattern that is animated by changing the palette.

If you have an eight-bit machine you can experience a similarly dramatic display by running *Fire8*. This uses mode 2 which, although rather chunky, provides 16 colours. The circle plotting is done using some fairly crude though effective machine code. A table of squares is built up.



FIRE8 PALETTE CHANGES

Then each pixel has its distance from the centre of the screen calculated using this table. A colour is chosen according to the distance, so concentric rings of sequential colours are built up. Only colours zero to 14 are used – colour 15 is reserved for the black that is introduced around the edges after distortion.

Two machine code routines are included for quick distortion – `shiftcol` and `shiftrow` respectively move a column or row of pixels a specified amount (passed in A). Colours are alternated by changing the palette – just as *Fire32* does. In fact they are changed in order to form four sweeping bands – magenta, red, magenta, white. *Fire8* below shows eight typical adjacent rings. These are plotted in colours zero to seven for example. At the outset, colours zero to three are set to green and four to seven to red. The next frame colour zero becomes blue, one to four are green and five to seven are set to red. As this process continues the green band has been replaced entirely by the blue and the red by the green.

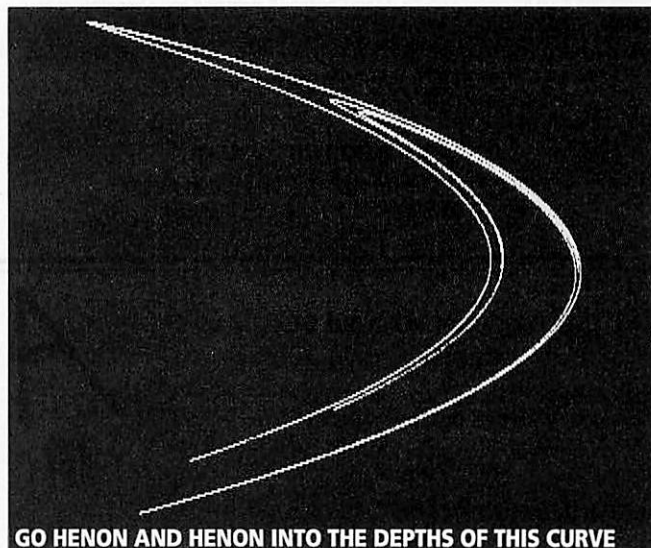
Each colour remains the same for four consecutive frames and this allows the animation to trick the eye more convincingly.

★PRIZE £20★

HENON AND ON AND ON

☐ Last November we issued a challenge to write a machine code version of Gareth Eley's *Henon* curve plotter. Well, four months on, and here's what we wanted. **Michael Rozduba** of Bedlington was been beavering away and come up with *Henon* – the return. On running the program, the curve is built up very quickly in the centre of the screen. Holding down the Menu button allows you to pan over the curve using the mouse. The Select button zooms in and the Adjust button zooms out.

The 'clever' bit is that the program only plots when you are not altering the image, so you do not have to wait for the



zoomed image to be completely drawn before you can zoom or pan again.

Michael managed to speed up the program quite dramatically by subtly altering the A and B parameters in the original. They used to be 1.4 and 0.3, but after a bit of experimentation, he found that 1.5 and 0.25 worked just as well and are much easier to work with in fixed point arithmetic in Arm code.

The resulting code can generate nearly 33,500 points per second – this is almost 20 times faster than Gareth's original version!

HANDY HINT

B We recently had a request from **Richard Fortescue**, a BAU reader who has the use of only one hand. He explained that holding down SHIFT or CTRL with another key could be difficult and sometimes impossible. Although CAPS LOCK (and on eight-bit machines, SHIFT LOCK) go some way to helping, a better solution was needed.

We have come up with two programs, for 32-bit and eight-bit machines. We hope they will go some way to helping users who may have similar special needs, but if you have a better solution or indeed any tips or programs that might help, we would be delighted to publish them.

Handy32 is the Archimedes version and the small Basic program assembles a module

called *Handy*. This, when loaded, provides two commands – `*HandyOn` and `*HandyOff` – used to turn the special SHIFT and CTRL facility on and off respectively.

When on, a single press of SHIFT or CONTROL will cause the next keypress to behave as if SHIFT or CONTROL were held down at the same time. Any keys may be SHIFTed or CTRLed in this way, including function and cursor keys. You may apply SHIFT and CTRL to a subsequent keypress by pressing them in order.

The short Archimedes solution is made possible by two features unique to the 32-bit machines. Firstly, an event occurs when a key is pressed or released and this can be trapped to keep a note of when SHIFT and CTRL are pressed. Secondly, an `OsByte` call (202 in fact) can be used to make the computer think SHIFT or CTRL are being pressed, even when they're not.

The eight-bit solution, *Handy8*, is a little more involved. It assembles a short piece of code at &900 which is saved as *Handy*. To install the code simply `*Run Handy`. Do not install it twice. Again, SHIFT and CTRL take effect on any subsequent keypress. Incidentally, with both versions of the code you can cancel a SHIFT or CTRL simply by pressing the same key again.

Although `OS_Byte 202` is available on the Beeb and other eight-bit machines, it is only really useful for setting

Weather Data

Weather Satellite Systems Now available for the Acorn Archimedes A310 and A3000. This Meteosat system comes complete including everything from the Antenna to the software. Animation is standard allowing the dynamic progress of weather fronts to be monitored and tracked. High resolution images of 800 pixels by 800 lines can be stored and manipulated in colour or grey scales on any standard colour monitor. Acorn Change FSI registered and compatible. Capable of receiving up to 400 images every day this remarkable system costs just £799.00

Other Timestep products include a fully featured **LANDSAT** Image Processor with 20 field study images and three full colour manuals. Acorn Change FSI registered and compatible at only £99.95

PC Globe and **PC USA** are full colour graphical databases of the world with an amazing amount of retrievable data. The special Timestep education price is only £59.95

Send for our full catalogue.

Timestep Weather Systems

Wickhambrook Newmarket, CB8 8QA England.

Tel: 0440 820040 Fax: 0440 820281

FREE support with all our systems

- *Expert advice! on system purchase
- *Expert help! on using your system
- *Expert backup! software support and hardware servicing

Consult the experts!

CSS Computer Centre

Unit 3A Townfoot Ind. Est. BRAMPTON
Cumbria CA8 1SW
☎ 06977 3779

Acorn Qualified dealers and Unix centre

Authorised SJ Networks, installer *Education specialists
Government plc and education orders welcome



Acorn
The choice of experience.



BEEBUG Magazine

the only magazine still devoted solely to the BBC Micro and the Master 128

BEEBUG was the first magazine ever published to cater for BBC enthusiasts, and is still going strong in its

10th year of publication

BEEBUG offers a wealth of information: from articles on how to write Basic programs to ready-to-use utilities and complete stand-alone applications. BEEBUG also offers frequent 'fun' programs and entertaining games.

If you want to find out more, write to us for a

FREE BEEBUG magazine

or phone on 0727 40303.

Please quote A3 to receive your free magazine.

RISC Developments, 117 Hatfield Rd.
St. Albans, Herts AL1 4JS

OPEN SYSTEMS INTER NETWORKING

Acorn have had the foresight to write software to allow common links to many types of machines.

The protocol which allows this is TCP/IP (Transport Control Protocol/Internet Protocol). This defines the packets which travel over Ethernet.

Chameleon sell products which allow Terminal emulation, File Transfer, X Windows terminals and allow you to use the hard disk on a Sun type Network file system (NFS).

These products let us link: ACORN, APPLE, IBM PC and most UNIX machines also usefully connect to Novell Fileservers.

Please do not hesitate to contact us to discuss your connectivity problems (UNIX not required)

ECONET IS DEAD - LONG LIVE ETHERNET!

At last the A3000 has an Ethernet Adaptor! This means that all ACORN Risc machines can be internetworked leaving Econet to the trusty 6502.



UNIX MACHINES PRICE DECREASE!



ACORN R225 ARM3 4Mb RAM
Discless Ethernet....£ 1830.00

ACORN R260 ARM3 8Mb RAM
100 Mb hard Disc...£3495.00

ACORN R140 ARM2 4Mb RAM
Now discontinued, we usually have traded-in R140s for sale!

UNIX UPGRADES

R140 OWNERS (If covered by Microcare).....£349.00
(Microcare expired).....£399.00

A440 / 540 etc.£999.00

If you want to run RISC IX 1.2 on your Acorn Archimedes, we are offering an upgrade service. This latest version of ACORN UNIX requires 100 Mb, an ACORN SCSI card and 4Mb of memory. We can arrange for it to be installed on your current 100Mb SCSI anywhere in the UK mainland. Alternatively it can be purchased pre-installed on the WARP DRIVE ready for use.

This is the same version of UNIX as supplied on the R260.

UNIX STORAGE (Also RISC OS)

In our search for the fastest drive to support RISC IX (Acorn's UNIX), we have produced the Warp Drive a high performance SCSI drive in conjunction with Acorn's SCSI controller card included in R260 computers or an extra £220+VAT if your machine is not already fitted. These devices will work with other controllers but UNIX will not.



Size	Speed	External	Internal
105Mb	9ms	£ 410	£ 310
210Mb	9ms	£ 675	£ 575
420Mb	12ms	£1095	£ 995
676Mb	16ms	£1315	
1000Mb	15ms	£1735	
1600Mb	16ms	£2050	

NEW: SCSI Tape Streamers 150Mb or 525Mb
Two year warranty on all Warp Drives

All Prices add VAT @ 17.5% (15%+2.5% Poll Tax subsidy)



For the Serious Acorn User

CHAMELEON
COMPUTERS LTD.

Stowell Technology Centre
Montford Street
Salford M5 2SE

TEL (061) 745 9849



the state of CAPS LOCK and SHIFT LOCK. Bits can be set for SHIFT and CTRL but it seems that the operating system resets them whenever GET or INKEY is used.

Also, there is no key up/down event, so we are really quite stuck. The solution, although inelegant, goes as follows. The vertical sync event is trapped which calls a routine of ours 50 times per second. Each time, the CTRL and SHIFT keys are examined by calling the key vector KeyV and their state is noted. The two calls OS_Rdch (used by Basic GET) and OS_Byte 129 (used by Basic INKEY) are also intercepted.

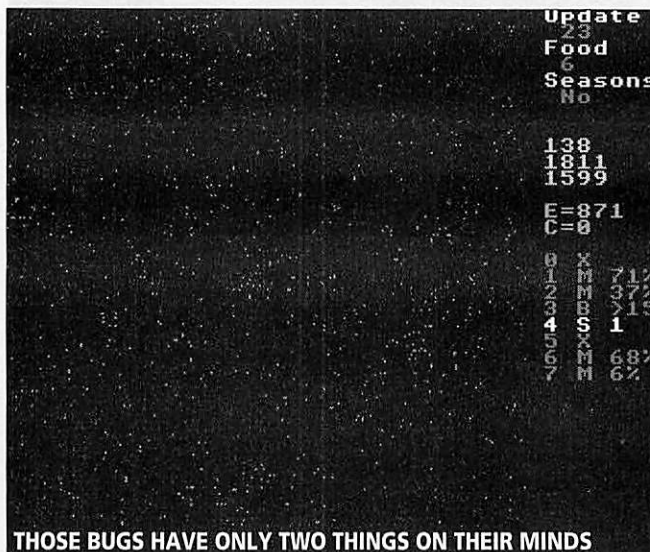
The operating system routines for OS_Rdch and OS_Byte 129 are called by our code which then modifies the characters returned depending on whether SHIFT or CTRL preceded the keypress. This is a fiddly process, and required look-up tables, but it works well enough.

Because the eight-bit solution is not 'official' in the way that the Archimedes version is, it cannot be guaranteed to exactly emulate true SHIFT and CTRL. Programs that detect keys other than by GET or INKEY, or use INKEY with a negative value to directly check SHIFT or CTRL will not work. The Archimedes version will always work since the proper OS_Byte call behaves as it should.

★PRIZE £10★ YOU'RE A WINNER

B A short, but potentially money-spinning offering, comes from **Robert Place**. It's a pools prediction program. Robert claims to have had some success using his listing, so why not give it a try – and tell us if you win a fortune!

Predictor (not to be confused with a commercially available product of the same name) asks for two team names and details. These include league position, number of games played and won, and the number of goals conceded. Ratings are calculated for each team and the expected outcome –



THE LAWS OF BUGLAND

Bugland Genetic Code

TURN x% – Turn to a random direction with an x% chance
LOOP n off – If counter is zero, set it to n and branch back off instructions. Otherwise, decrement the counter. If zero, proceed otherwise branch back off instructions.

BREED e – Breed if energy level is greater than e*64

ENERGY i – If energy level<256, jump to instruction i

SEE i – If food can be seen, jump to instruction i

JUMP i – Jump to instruction i

MOVE x% – Move forward with an x% chance

XA – spare gene that does nothing

A designer bug

- 0 MOVE 96%
- 1 SEE 0
- 2 BREED >28
- 3 TURN 31%
- 4 JUMP 0
- 5 JUMP 0
- 6 JUMP 0
- 7 JUMP 0

An intelligent life form that evolved

- 0 MOVE 62%
- 1 LOOP 5 6
- 2 JUMP 6
- 3 BREED >20
- 4 MOVE 18%
- 5 MOVE 65%
- 6 SEE 3
- 7 TURN 65%

win or draw – is displayed. Currently no distinction is made between score and non-score draws, so perhaps an interested reader might like to enhance the program. Please make cheques payable to...

MORE BUGS

Last month we brought you **I. Reeve's Bugworld**, the most adventurous evolution program yet. This month we present **Bugland**, a fast Arm code version that takes things a stage further. The basic principles involved in **Bugland** are very similar to the original **Bugworld** and full credit for the originality of the idea must go to Mr Reeve. Basically, individual organ-

isms or 'bugs' have genetic patterns that take the form of simple programs which control how the bug behaves. **Bugland** bugs have programs consisting of eight genetic instructions and each instruction can be one of eight types. As in **Bugworld**, when bugs breed there is a chance that their offspring will mutate and some mutations will be better equipped for survival than their parents.

Before explaining how **Bugworld** works, I'd recommend you simply play with it for a while. The world consists of a 256 x 256 grassy area. At the outset, 50 entirely 'random' creatures are created and placed at random locations. They are random in the sense that their genetic programs

consist only of eight randomly chosen numbers. Most of the genetic programs will be non-sense and many of the initial population will simply stay still and die out, others will have some form of urge to move and will thus find food and live longer, while others may still have an urge to breed – and this is where the possibility of evolution lies. From quite stupid ancestors, relatively intelligent creatures can soon come about.

Bugs are shown as single dots (for speed more than anything). When a bug has children they are of a different colour if mutation has occurred. On the right is a simple menu: select an item with the up and down cursor keys and alter the value/state with left and right.

SHIFT can be pressed for more rapid changes. The update rate is how often you view **Bugworld**: a rate of one means you see every move, a rate of 30 means you only see a snapshot every 30 moves. Alter the value to 'fast forward' evolution, or slow it down for closer inspection.

The food rate is simply how quickly the grass grows. You can switch 'seasons' on by selecting the third option on the menu. In this case the food value is a mean for a 'bug year' and the actual grass-growing rate rises to a peak in the summer and falls to a low in the winter.

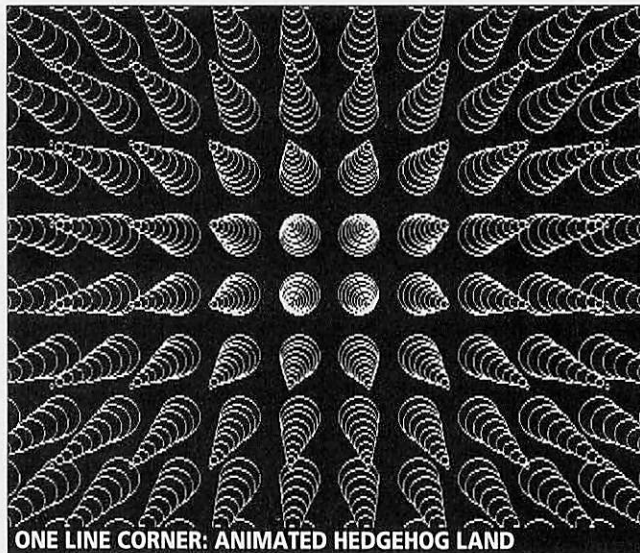
Seasons can be used to enhance and even accelerate the evolution rate. A harsh winter is a good way of sorting out the bugs from the buglets! Three numbers below the menu show the food rate, the number of bug moves starting from zero (time), and the population, which has an arbitrary limit of 4096.

Click on a bug with Select and a white circle will appear around it. The program of the chosen creature is shown on the right with the current instruction highlighted. Slow the update speed to one and hold down CTRL or CTRL and SHIFT to follow the program more carefully. You can also place your own designer bugs by clicking on **Bugworld** with

Adjust. The table on page 53 shows my own designer bug's program, but you can easily adapt it yourself.

Bugland differs from *Bugworld* in several respects. Firstly, the rules are a little simpler. Each genetic instruction consists of a one byte code – three bits of this make up the instruction type, the remaining five are data. Figure one lists the valid *Bugland* genes and, since each one-byte value is a valid gene (however stupid), mutation can be simplified and indeed, *Bugworld* bugs mutate by one or more bytes of their program being changed to random values.

Other factors are simplified – mutation occurs with a fixed probability for example, and all the bugs are vegetarian! It would slow the program down quite a lot to add extra factors, but feel free to try. The reason I haven't done so is because of the main difference between the two programs – namely speed. Typically, 100 or more 'moves' may occur per second, more if there are few



bugs on the screen and more still, if you are lucky enough to have an Arm3.

Often, major examples of evolution occur only after thousands of moves, so it is vital for the program to operate quickly. Many tricks are employed to increase the program's speed. Bugs are stored in the form of a linked list – a similar list exists for 'bugs to

be'. When a bug dies, it is simply patched out of the list and its workspace is patched in to the free space list. The reverse of this happens whenever a new bug is born.

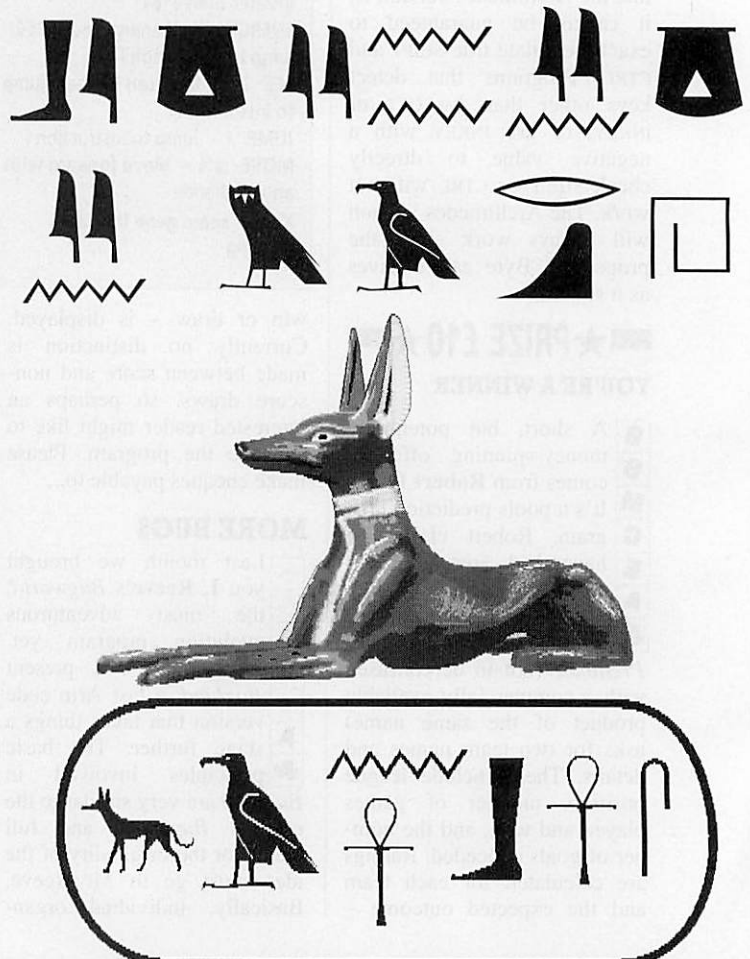
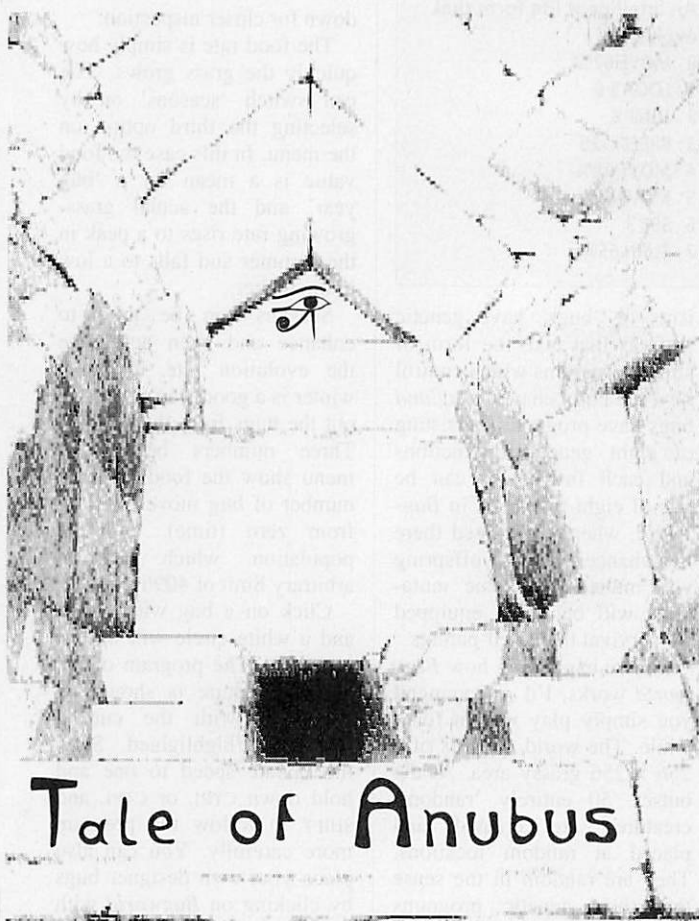
Another difference from *Bugworld* lies in the fact that breeding is now controlled by a gene. Some bugs may evolve early on and survive to a great age without being able to

breed. On the other hand, when food is plentiful, waves of mutants who have nothing but breeding on their little buggy minds can sweep across the screen.

The table on page 53 shows the designer bug's program. Basically it moves forward rapidly to find food – when it can't see any, it turns occasionally and when strong enough will breed. This is quite a successful program and if you introduce these to the world at an early stage, the designer bugs soon take over. However, after only a few thousand moves other bugs often evolve that are even more successful.

Figure four shows the program of a bug that evolved after 28,000 moves. It is difficult to see why this natural bug is more successful than the designer one, but in a competition for food the natural bug wins!

The question is: are we seeing the evolution of true intelligence? Yes, since the evolved solution to the prob-

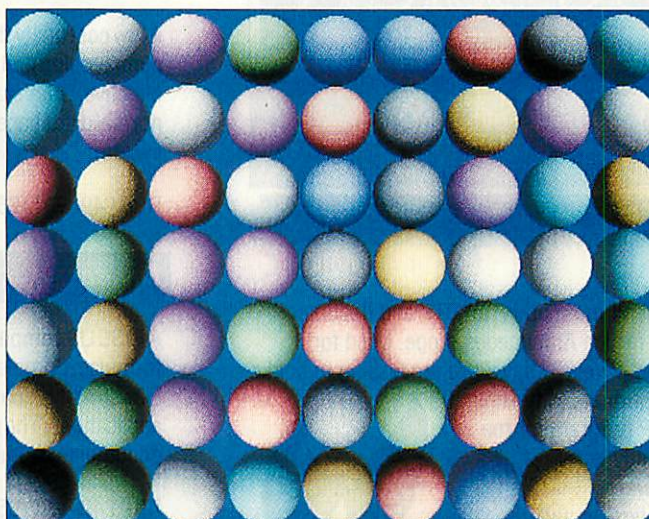


lem of survival works better than the man-made one. On the other hand, *Bugland* suffers from the same problem that all evolutionary programs have – foresight. True evolution has no idea where it's going – it simply goes.

Take eyesight, for example – our eyes have developed over billions of years, so it's not surprising that we have to give our program the advantage of a pre-designed sight gene to hurry things along. We are also limited by population – compare 4096 computer bugs with a whole planet full of organisms.

★ **PRIZE £10** ★
ONE LINE CORNER

There is only a single Archimedes one-liner this month, but it's a good one, again from **Jan Vibe**. You'll need 160K, of screen memory to run it and in this it builds up eight complete mode 0 screens which are then animated. The result is quite



ONE OF THE GRAPHICAL DITTIES, ON THE SUBSCRIBERS' DISC

surprising and somewhat reminiscent of flying over the surface of a very large and particularly painful looking morning star!

***DISC**

This is a new section for ★INFO. As we have mentioned recently, we are hoping to carry a few extra programs on the monthly subscribers' disc. In general these will be

large 32-bit desktop applications – too long to sensibly list on the yellow pages. We won't ever go into too much detail explaining the programs on these pages, instead help will be given on the disc. To start the ball rolling, we have an auto program 'backing up system' from **Brian Higgins** of Dublin – read *!Help* for more information. Not only is

this a 'large desktop application', it has also been written in C. All the source code is on the disc.

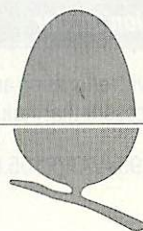
For non-programmers, there is a collection of ditties from regular button pusher **Jan Vlietinck**. These are programs we've wanted to print for quite some time but we never seem to have the space.

They are supplied as Jan sent them in, so apologies in advance for the non-BAU listing style. The purpose and function of these programs should be self explanatory.

***QUIT**

If you've written a program or just have a good idea, why not let us know? As we plan to include more 'extras' on the subscribers' disc, you can now send in all those long programs (especially Risc Os applications) that would strain both our yellow pages and your typing fingers. Please send your submissions on disc and with an sae to: ★INFO, *BBC Acorn User*, 20-26 Brunswick Place, London N1 6DJ.

Alsystems



**Canon ION Camera
plus
Video Digitiser**



ONLY £499 + VAT

TEL 0420 561111

47 Winchester Rd
Four Marks
Alton
GU34 5HG

IBM

SJ
RESEARCH

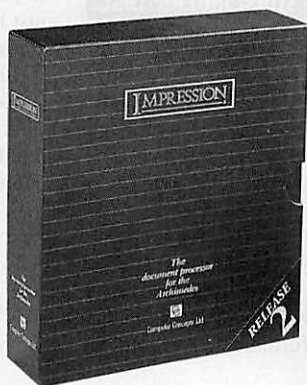
NOVELL

IMPRESSION

A W A R D
W I N N I N G
S O F T W A R E

Impression II

The most popular and most powerful DTP and document processor around for the Archimedes range. Used for everything from simple every day word processing to books and newstand magazines, Impression II is the ultimate DTP program for the Archimedes. Recently voted "Best non-PC software" at the Computer Shopper awards.

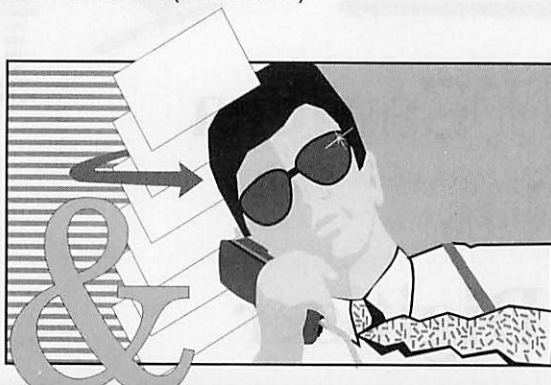


RRP £169+VAT (£198.57 incl.)

Impression Junior

Popular with education and all users who require a powerful word processor that includes DTP capabilities.

RRP £89.95+VAT (£105.69 incl.)



Impression Business Supplement

A set of utilities that extend and supplement Impression. This pack offers a simple mail merging facility, a new set of loaders for Word Perfect, Wordstar, Microsoft Word and a postscript utility for professional typesetting control from Impression. It even allows full (four) colour separations to be produced.

RRP £49+VAT (£57.57 incl.)

Compression

A low cost utility that offers completely transparent file compression and decompression. It's fast, simple to use and very effective. On average it compresses files to half or less of the normal disc space, effectively increasing the capacity of your disc system.

RRP £49+VAT (£57.57 incl.)

Equasor

A RISC OS compatible program for creating equations and formulae. Completely WYSIWYG, it can export equations as draw files so it's compatible with Impression and most RISC OS applications. The perfect tool for anyone wanting to produce documents containing mathematical equations of any sort.

RRP £49+VAT (£57.57 incl.)

Impression Border Disc

Impression II can load additional frame border designs created in !Draw. We have collected together 100 of the best designs generated by Impression customers. Liven up any document. (Not suitable for Impression Junior).

RRP £12.77+VAT (£15.00 incl.)

Font Disc

We offer two high quality disc packs. One, BookM, is an exact equivalent to the popular Bookman font, a rounded serif font, often used as an alternative to Trinity (Times). The other font pack, AvantG, is equivalent to the modern sans-serif AvantGarde font. Both fonts are compatible with all programs that use the outline font manager and are supplied in four variations (normal, italic, bold, bold italic).

RRP £20+VAT (£23.50 incl.) per font pack.

This advert can only give you brief details of our product range. Please contact us for a copy of the more detailed Product Guide. In many cases a full product specification is also available.



LaserDirect Qume**NEW
LOWER
PRICE**

6 pages per minute, 300 dpi
An incredibly low price for such a high quality printer. And not only do you get high performance, but the Qume is cheap to run - only 1.6p per page.

Price: £799.00 + VAT (£938.82 incl.)

Not suitable for the A540.

LaserDirect HiRes 4

4 pages per minute, 300 or 600dpi
This must be the cheapest 600 dpi laser printer available. But there's no reduction in the print quality or print speed. As LaserDirect HiRes 4 uses the Canon LBP-4 printer, you can also connect the printer to other types of computer such as a PC (although, when connected to these machines, printing is limited to 300dpi.)

Price: £999.00 + VAT (£1173.83 incl.)

Board only £399.00 + VAT (£468.82)

LaserDirect HiRes 8

8 pages per minute, 300 or 600dpi
This is the top model in the LaserDirect range. The Canon LBP-8 printer is well known for its reliability and print quality. Now using LaserDirect software and hardware, you can print at 300 or 600 dpi.

Price: £1495.00 + VAT (£1756.62 incl.)

**NEW
LOWER
PRICE****ScanLight Junior**

An A6 (105mm) hand-held scanner, with scan resolution up to 400 dpi. Powerful ScanLight Plus software.

Price: £129.00 + VAT (£151.57 incl.)

ScanLight A4**NEW
LOWER
PRICE**

A full A4 width hand-held scanner with a choice of resolutions up to 400 dpi. The ScanLight Plus software gives you a wide range of image manipulation and enhancement options.

Price: £299.00 + VAT (£351.32 incl.)

Special price including sheet feeder:
£399.00 + VAT (£468.82 incl.)

ScanLight Professional

A stunning recent addition to the ScanLight range, this professional quality flatbed scanner gives unequalled results. Up to 300dpi with 256 grey-levels means that images from this scanner can be included directly in typeset output. Connects to the Archimedes using a SCSI interface.

Price: £899.00 + VAT (£1056.33 incl.)
including SCSI £999.00 + VAT (£1173.82 incl.)

FaxPack**NOW
AVAILABLE**

Brings full fax capabilities to your Archimedes. Appears as a standard RISC OS printer - it takes only a few seconds to send a fax from any RISC OS application. Sends and receives in the background.

Price: £299.00 + VAT (£351.32 incl.)



Computer Concepts Ltd

Gaddesden Place
Hemel Hempstead
Herts HP2 6EX

Tel.: 0442 63933
Fax.: 0442 231632

VISA / ACCESS WELCOME



ARCHIMEDES

Moving on from last month's broad introduction to Arm programming, you are now ready to learn about the arithmetic capabilities of the chip, in terms of the commands that are provided. But as always, I'm afraid that before the practice, there has to be a little theory...

NUMBER THEORY

As mentioned last month, the Arm has 16 registers, numbered 0 to 15. The last, R15, is known as the program counter and is not generally useful in calculations. Likewise, R14 (the link register) is semi-dedicated and is not normally used by the programmer. I also said that R13 is out of bounds, although this is not strictly true.

The purpose of R14 and R15 is fixed, by the Arm chip – you cannot alter their functions in software – R15 is always the program counter and R14 is always set up by a BL instruction (we'll look at this next month); R13 is defined by Acorn to be the stack pointer and is just like a normal register. However it has a special purpose in Risc OS. For the moment though, we will stick to using the registers R0 to R12.

So on to numbers. Normally, we can represent any number we like by simply writing down a string of decimal digits. Computers, being essentially dumb machines, like things to be more simple than that. They only know the digits 0 and 1, rather than 0 to 9. Computers use this binary system to represent any number using just two digits.

Now this is real primary school stuff. A base 10 number is represented by multiplying the column value by the number in that column. The columns go up in powers, $10^0 = 1$, $10^1 = 10$, $10^2 = 100$, $10^3 = 1000$. So 1320 is $(1 \times 1000) + (3 \times 100) + (2 \times 10) + (0 \times 1)$. Similarly, base 2 numbers go up in powers of 2: $2^0 = 1$, $2^1 = 2$, $2^2 = 4$, $2^3 = 8$, $2^4 = 16$ and so on. So the binary number 10111 is converted into a decimal number thus $(1 \times 16) + (0 \times 8) + (1 \times 4) + (1 \times 2) + (1 \times 1) = 23$.

Binary is therefore base 2 and its 0s and 1s are called binary digits or, more conveniently, *bits*. All arithmetic in binary is carried out in exactly the same way as in decimal, you just have to remember to carry 2s rather than 10s. The only exception is negative numbers which I'll come on to in a while... oops, I almost said bit then!

You do not need to know about binary numbers yourself, the assembler converts your decimal numbers into the 1s and 0s for the computer. As you may have heard, the Arm is a 32-bit processor. In this case, this means that the registers are 32 bits wide – in other words they hold 32 0s and 1s. These are numbered 0 to 31 from least to most significant, so bit 0 is the units column, bit 1 is the 2s column and so on.

The 6502 – the BBC Model B's processor – is an eight-bit processor and has eight-bit registers. A 32-bit processor is therefore 'better' than an eight-bit one because it can handle larger numbers internally: the 6502's registers are limited to the range of 0 to 255, whereas the Arm can handle anything between 0 and 4,294,967,295.

So what about those negative numbers then? Well here comes the bodge in binary. The top bit of the binary number is set (so in the case of the Arm, bit 31 is set to 1 if you are dealing with

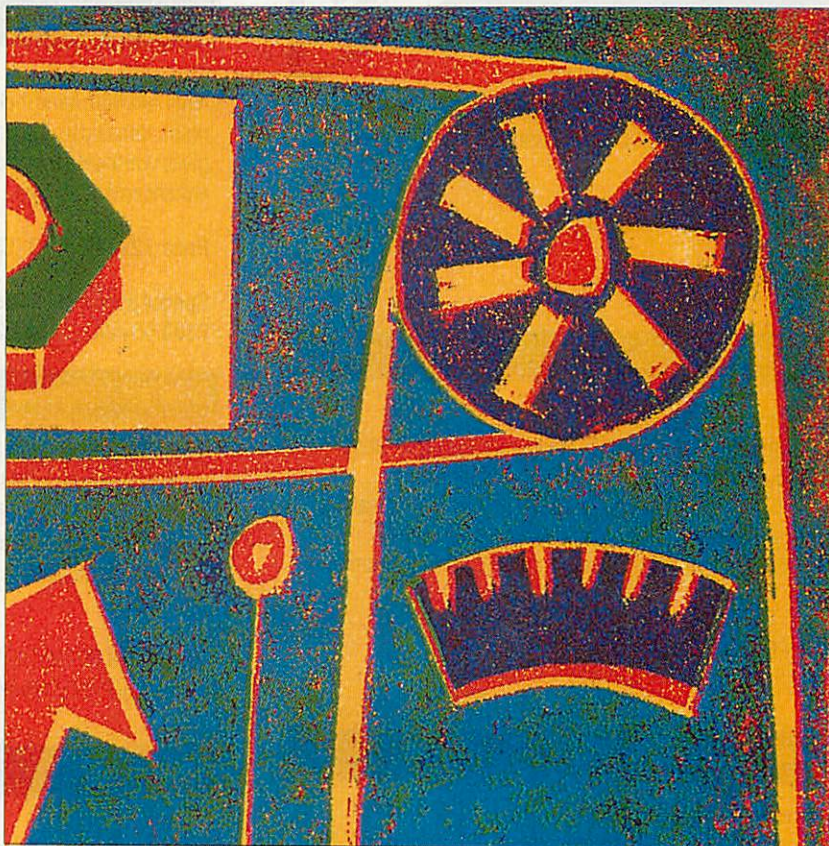


ILLUSTRATION BY PAUL SCHOFIELD

ASSEMBLY LINE

In part two of our series on Arm programming
DAVE LAWRENCE
shows you how to deal with numbers

a negative number, 0 if it is a positive number). The remaining bits then represent the number.

Of course life is never quite that simple. The value of a negative number is not minus the rest-of-the-bits. For a start you could have zero and minus zero using that system. Instead twos complement is used. You needn't know why it's called this, just how it works.

To make a binary number negative you change all its 0s to 1s and 1s to 0s and then add 1 to the result. Here are a couple of examples (as it is simpler, we have used an eight-bit processor in this example).

```
1 = 00000001
-> 11111110 (0>1 1>0)
+1 11111111 (= -1)
```



```
38 = 00100110
-> 11011001 (0>1 1>0)
+1 11011010 (= -38)

0 = 00000000
-> 11111111 (0>1 1>0)
+1 00000000 (= 0)
```

As you can see, when using this system -0 is the same as 0. The best way to visualise it is to imagine all the numbers from 0 to 255 (eight-bit processor again) written in a circle, 0 to 127 are always positive, 128 to 255 can either be 128 to 255 or -128 to -1 if you are using negative numbers. On the Arm, this system is identical except you can represent -2,147,483,648 (-2^{31}) to 0 to 2,148,483,647 ($2^{31}-1$).

INTO PRACTICE

Last month's example program only had two real Arm instructions, and one of those was an operating system call. The other was MOV. This is short for move and it takes two parameters, a source and a destination. MOV simply moves the source number to the destination. The destination must be a register, the source can either be a register or a number. For example, `MOV R0, #42` will place 42 into register 0. Note that Arm instructions read in a similar way to Basic assignments with the destination to the left of the arguments ($A\% = 42$). Given this, you should be able to work out these examples.

```
MOV R1, #89
MOV R2, R1
```

So, now that we can put numbers into registers, we need some means of manipulating them. Last month I mentioned that there are six instructions for addition and subtraction and two for multiplication. The two simplest of these are ADD and SUB and I'm afraid there are no prizes for guessing what these do.

Both take three parameters, a destination (as with MOV) and two sources. As indeed do conventional sums ($A = B + C$). The destination and first source must be registers, but the second can be a number as shown below.

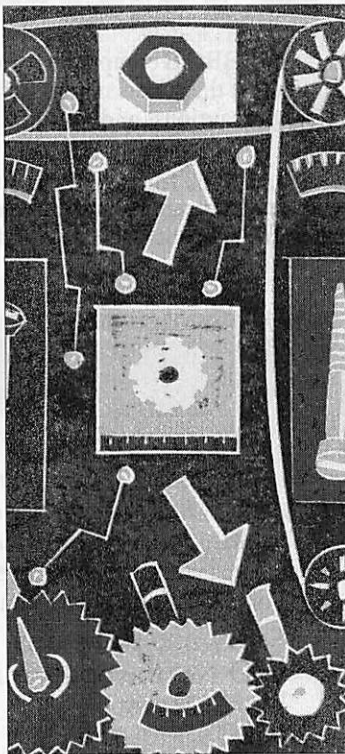
```
ADD R0, R1, R2 (R0=R1+R2)
ADD R0, R0, #1 (R0=R0+1)
SUB R1, R3, #4 (R1=R3-4)
SUB R7, R2, R3 (R7=R2-R3)
```

If I now tell you one clever Basic keyword, you can try these instructions out.

CALL and USR

Basic provides two methods of running machine code program. Last month you met CALL. If you typed CALL hello the demo was run. No data was passed back to you and so CALL behaved a bit like a simple procedure call. To get a value back from a piece of code, the simplest way is to use USR. This is more like a function as it returns a value which you can assign to variable or PRINT. If you use something like the following line `result=USR(mycode)` the machine code at mycode will be executed and at the end the contents of Arm register 0 (R0) will be returned to Basic and, in the example above, assigned to the variable result. To see this in action, try typing in listing one in the yellow pages.

You should recognise the initialisation and associated Basic blurb from last month's example, so I'll start at code itself. Line numbers are shown in the square brackets.



YELLOW PAGES

To find the programs mentioned in this article, turn to yellow pages, under the section entitled Arc Assembler. They can also be found on the subscribers' monthly disc.

Firstly, 5 is stored in R0 [130] and 9 in R1 [140]. These are then added together and stored in R2 [150]; 7 is added to R2 and the result put back in R0 [160]. R1 is then changed to 3 [170] and is subtracted from R0, the result being stored back in R1 [180]. Finally, R0 is decremented by 1 [190]. Remember that MOV pc,link returns the computer to Basic for us? If you work this out in your head you should come up with a value of 17 – run the program and press SPACE to see if your Archimedes agrees!

I am only going to introduce one more of the six simple instructions now. The rest will be revealed when I deal with big numbers later on in the series. This is RSB, or Reverse SuBtract. It is identical in operation to SUB except that the first source is subtracted from the second rather than the other way round. This allows you to subtract registers from constants which you cannot do with SUB as the first source must be a register. The following should make this clear.

```
RSB R0, R1, R2 (R0=R2-R1)
RSB R1, R3, #9 (R1=9-R3)
RSB R0, R0, #0 (R0=-R0)
```

Try changing line 190 of the demo program to `RSB R0, R0, #30` and re-running it. Is the result as you would expect?

Feel free to fiddle with this program as much as you like. For the moment avoid trying to load registers with negative numbers (it won't work) and stick to values less than 256. First thing next month I'll explain why, I promise! Intermediate results larger than 255, or less than zero, will cause no problems and the correct result should be printed at the end.

MULTIPLICATION

The multiplication instruction is MUL. As with ADD and SUB, it takes three parameters, however they must all be registers, so if you need to multiply by a constant, you have to load it into a register first. In addition, the first source register cannot be the same as the destination. So `MUL R0, R1, R2` ($R0=R1 \times R2$) is valid, but `MUL R0, R0, R1` (ERROR!) is not. The two sources can be same (thus squaring the number) and, of course, the second source can be the same as the destination.

```
MUL R0, R1, R0 (R0=R1*R0)
MUL R2, R4, R4 (R2=R4^2)
```

The 'other' multiply instruction, is merely an extension of this. The MLA stands for MuLtiPly and Add, and allows a third source register to be supplied. (It must be a register; there are no numbers allowed here.) This is added to the result of the multiplication before it is stored in the destination.

Listing two in the yellow pages demonstrates the use of MUL and MLA. R1 is set to 5 [130] and R2 to 9 [140]. These are multiplied and stored in R0 [150]. R1 and R2 are set to 2 and 10 respectively [160 and 170]. The previous result (R0) is multiplied by R1; R2 is added to the result and the total is returned to R0 [180]. The final sum is: $(5 \times 9) \times 2 + 10 = 100$. As with the previous example, please feel free to experiment with the numbers given. As before steer clear of negatives and numbers greater than 255.

Next month, we'll look at the barrel shifter, and, no, it's not some kind of fairground ride...

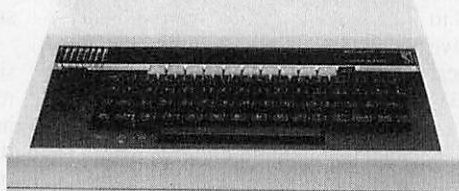
Hobbyists! Teachers! Educationalists! Parents! Acorn BBC B Micro Computers

Originally manufactured for export, these high quality BBC B computers have never been used and contain a number of extra features, detailed below. Specially constructed to meet the superior quality standards of the American FCC, these machines have steel reinforced keyboards, additional safety precautions, and should, if looked after, last a lifetime!

SRP £180
Education Price
£150.00!
£176.25 IncVAT

We offer these machines for sale as fully modified & bench tested for the UK.

(A six month warranty applies from date of delivery).



We know of people who have paid £220.00 just to get a second hand machine - at only £150.00 this has to be an opportunity not to be missed! Ideal for use in schools, colleges, or at home!

For trade enquiries &/or for discounts on 5 or more units:-



Greyhound Marketing

Cliffdale House
376 Meanwood Road
LEEDS
LS7 2JH



0532 621111 Fax 0532 374163

For 1 to 5 units please contact

Software Bargains
C/O Northwood House
North Street
LEEDS
LS7 2AA



0532 436300 Fax 0532 423289

Specifications

- * UHF PAL output
for use on black & white & colour TVs
- * TTL output for RGB monitors
- * Composite video output for mono monitors
- * Parallel printer port, 15pin joystick socket & cassette tape connection
- * 8271 Disc Interface
- * DNFS filing system (DFS v 1.2, NFS v 3.6)
- * UK Operating System & BASIC
- * User Manuals & Welcome disc (80t only)

Additional Features

- * View Word Processing ROM v 2.1
- * Speech System
(Comprising Speech Processor & Phrase ROM)
- * Econet network Interface
(NB This interface together with the 1Mhz bus has not been tested & accordingly are not guaranteed to be functional)

Whilst every effort has been made to ensure the accuracy of this information, we reserve the right to make changes & alterations without prior notice. Please note that these computers may not be compatible with all UK BBC B software, nor with hardware add-ons.

Gnome Computers Limited

25A Huntingdon Street, St. Neots, Cambs, PE19 1BG
Tel./Fax: 0480 406164 E-Mail: support@gnome.co.uk

X Window System R11.4

This software package, developed in association with Acorn Computers, converts a RISC OS based Archimedes into an X Terminal. The software will allow communication with X clients over Ethernet or Econet.

X Software	£199
Complete Colour X Terminals from	£1150

Archimedes upgrades

ARM 3 Upgrade	£260
A440/R140 4-8MB Memory Upgrade	£650
External SCSI 200MB H/D + Acorn SCSI Card	£1250
External SCSI 750MB H/D + Acorn SCSI Card	£1900
External 150MByte SCSI Tape Drive	£850

Transputer Systems

Gnome Computers offers a complete range of transputer boards to fit into either RISC OS or RISC iX based Archimedes machines. Prices start at £1385 for a single 10 MIP, 2 MFLOP transputer system including a parallel FORTRAN-77, C, Pascal, Modula-2 or Occam compiler.

UNIX & Network Specialists



Books for the Acorn Archimedes

DESKTOP PUBLISHING ON THE ARCHIMEDES DTP for All

Bruce Goatly, Head of Publishing at Britain's Leading Scientific Society, London, UK

The Acorn Archimedes is the type of fast and powerful machine that is essential for DTP work. Bruce Goatly's book explains the fundamentals of DTP - the terminology and the technology. The advantages of the Acorn RISC operating systems are described together with how to set up the Archimedes in an optimal manner for DTP and how to choose the optional extras needed. The 'Impression' DTP package is used to exemplify a leading-edge system for the Archimedes although the author also uses 'Acorn DTP' and 'Ovation' throughout.

This book is prepared on the Archimedes, which makes the author well placed to describe all the tricks of the trade for producing text and illustrations as well as the problems of managing large documents.

185058 248.3 December 1991 294pp £12.95/\$26.95 Published by Sigma Press, UK.



PROGRAMMING IN ANSI STANDARD C

Gordon Horsington, Gwent, Wales, UK

Gordon Horsington first wrote about C in a BBC telesoftware series for the Acorn master series of computers. This new book is a major development of a tried and tested formula and has been thoroughly tested on the Acorn Archimedes.

Programming in ANSI Standard C will give a novice, with some experience of BASIC and operating systems, a good working knowledge of the C language. The standards of the ANSI dialect of C are adhered to throughout. Rather than define the syntax of C, as in a language manual, the author teaches by examples. Well over 100 programs are used to illustrate the various features of the language. Topics include: the pre-processor; declaring data types; variable storage; functions and macros; pointers arrays; character strings; data structures; file handling; printing techniques and problems.

185058 257.2 October 1991 264pp £14.95/\$30.95 Published by Sigma Press, UK.

Order from your Bookseller or send a cheque made payable to 'John Wiley & Sons Ltd', Customer Services, Distribution Centre, Southern Cross Trading Estate, 1 Oldlands Way, Bognor Regis, West Sussex, PO22 9SA. Credit cards to Fax: (0243) 820250 or Tel: (0243) 829121. Please add £1.95/\$4.95 p&p. Postage is FREE when you order two or more books

SETTING STANDARDS

Don't be fooled into thinking that dot-matrix printing is dead. While most of the attention these days seems to be directed at laser and inkjet printers, the dot-matrix printer market is still very much alive.

In fact, dot-matrix printers account for around 60 per cent of all the printers currently sold. Epson, the company that practically invented dot-matrix printing, produces around half of these machines so, understandably, it is keen to preserve its bread and butter business.

The future of dot-matrix printers now seems assured thanks to Epson's latest development, ESC/P2. This is the second version of the ESC/P control code standard (Epson Standard Code for Printers) now known widely as Epson LQ compatibility. The company claims that ESC/P2 brings some features of page printers to the world of dot-matrix printing. This will certainly find favour among eight-bit BBC Master 128 and Model B users who cannot make use of many of the attractive features of a laser printer.

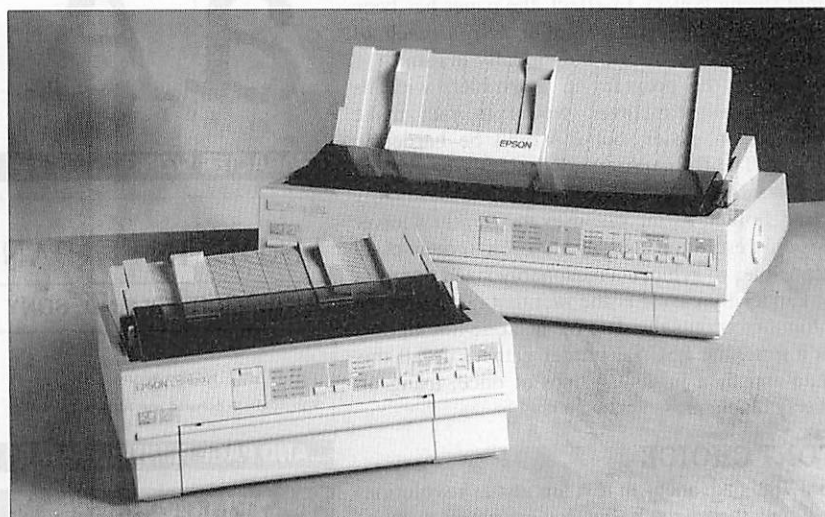
But it isn't just the control codes which have been developed – ESC/P2 goes further than that with several features entirely new to dot-matrix printer design.

NEW STANDARD

The ESC/P2 standard has been introduced across a range of new Epson 24-pin printers and is likely to be adopted by other manufacturers. If they latch on to the new standard as enthusiastically as they did to the original, there will soon be an epidemic of new 24-pin printers with ESC/P2 compatibility.

There are four Epson ESC/P2 models available at present – the LQ-570 and LQ-870 plus the wide carriage versions, the LQ-1070 and LQ-1170. The good news is that the higher standard does not mean higher prices. The new Epson models range from £339 to £729 – fairly typical prices for this quality and speed, which will almost certainly be discounted by dealers. Although the cost of the rival laser printer is falling all the time, the running costs of a laser can make them very expensive to use.

Mechanically, the new printers remain virtually unchanged – they are 24-pin machines which print with two rows of 12 pins hammering from the printhead, through an inked ribbon on to the paper, to create shapes made up of individual dots. A point to note is that ESC/P does not apply to 9-pin printers – even Epson seems to admit that these have had their day. The new control codes are totally compatible with ESC/P printers and when used with soft-



THE LQ-570/1070 PRINTERS ARE THE FIRST TO USE THE NEW EPSON STANDARD

Epson is ensuring the survival of dot-matrix printing by introducing a new standard code.

MALCOLM BROWN

investigates

ware intended for current machines, the ESC/P2 printers will produce equally good results.

The printers offer two printing modes, draft or near letter quality (NLQ). In fact ESC/P2 provides for all the functions catered for by the current codes – font selection, page formatting, user-defined characters and graphics – but offers advances in three main areas: graphics, fonts and general design.

BETTER GRAPHICS

The graphics enhancements are based around one simple mechanical advance. The new machines can print two dots next to each other. At the highest resolution of 360 dots per inch (better than most laser printers) ESC/P2 printers required two passes of the printhead over each line of the image; ESC/P2 machines can print to this resolution in just one pass.

This not only speeds up graphic dumps but, because each line is produced in one go, the dots are positioned more accurately and the resulting images are marginally more even.

RASTER MODE

Leading from this printhead advance is a new raster graphics mode which makes child's play of the task of writing dump software. Rather than split the screen image into vertical strips of 24 pixels (not a very computer-friendly number) the raster graphics mode operates just like a television raster display. An ESC/P2 dump program simply outputs in turn a one or a zero for each dot in a line across the paper. What's more, the dot spacing is the same vertically and

horizontally, so circles are printed as circles, squares as squares, and so on.

The vertical and horizontal resolutions can be set to either 360 or 180dpi and for different screen memory maps, you can output two or more rows of dots at once. It is also possible to output the data in a compressed form of print data followed by a count.

Listing one (see our Yellow Pages box below for details) demonstrates how the raster graphics mode can be used with graphics programs. The program simply looks at each pixel on a mode 0 screen in turn and sends a set or reset bit to the printer according to whether the pixel is lit or unlit (using POINT). In effect, the paper has been split into print pixels 1/360in across, each of which can be addressed individually in turn.

Writing the program in assembler, with its register shift functions, would in fact make things even easier, but it would be harder to follow. The Basic program we supply has lots of REM statements to make its operation reasonably clear. In fact, listing one uses the printer's lower 180dpi resolution and prints each screen pixel four times to achieve a reasonably sized dump.

Especially clever is the fact that, although the program outputs the data for just one line of dots at a time, the ESC/P2 printer gathers up all this data and then prints 24 lines at once, using all the available pins.

FONT CHOICE

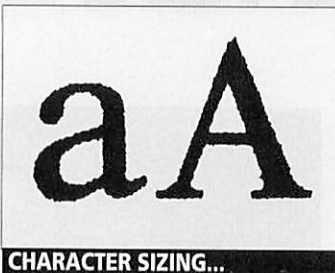
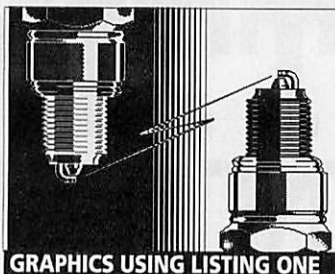
ESC/P2's advances in text are just as revolutionary and somewhat easier for everyone to make use of. The four Epson ESC/P2 printers offer an excellent range of nine NLQ fonts, two of which (Roman and Sans Serif) are fully scaleable and can be printed any size from 8 to 32 points high (about 3mm to 12mm) in 2pt steps.

The different sizes are not formed by distorting the fixed size characters, (the old ESC/P characters are printed in double height, compressed, and so on) but with genuine re-sized character outlines just like Archimedes or Postscript characters, as shown in our second example above. A single, albeit lengthy, command which is easy to insert into a Wordwise file or View printer driver selects the character size and the printer looks after the rest. Larger characters require more than a single line of print but the printer handles this automatically.

Our third example is rather more trivial – it is a *Wordwise* document that demonstrates the character sizing by producing one page of the Sony chairman Akio Morita's autobiography. It shows just how close to DTP this will allow Beeb owners to get. The entire page was created, without too much effort, using just *Wordwise Plus* and the Epson LQ-870 and it took about 40 seconds to print.

For Acorn users, the other text addition is somewhat minor: ESC/P2 also allows the whole IBM character set to be printed, including Ascii numbers 1-20, 22-31 and 127 (card suits, smiley faces, musical notes, arrows and so on) not produced by old ESC/P machines.

Apart from giving a few extra characters to print, this completes the tie up between Epson and IBM compatibility and this should serve to extend the popularity of the ESC/P2 code.



MADE IN JAPAN

AKIO MORITA AND SONY

by Akio Morita
with Edwin M Reingold and Mitsuko Shimomura

...AND PAGE PRINTING DETAIL

YELLOW PAGES

All of the listings mentioned in this article can be found in Yellow Pages under the heading Printers. Of course, in time software will be written to take full advantage of the new printer codes but these programs make an excellent starting point. Instructions on how to type in a listing can be found on page 81. The listings can also be found on the subscriber's monthly disc (get yours free by subscribing to BBC Acorn User – see page 29.)

GENERAL DESIGN

Other general improvements include a radical, but carefully thought out, design approach. These machines look weird, having a strange tilted styling that puts the controls to the fore wherever you choose to position your printer.

The font in use and the character pitch can all be selected from the comprehensive front panel, along with the usual paper line and form feed. Likewise the paper handling is as versatile as it is possible to be. Paper can enter these machines from the top, the rear, the front or the base. Needless to say, paper loading is automatic.

With the various optional cut sheet feeders (low and high capacity bins are available for paper or envelopes and even a two-bin arrangement is possible), and the optional and built-in tractor feeds, up to five different paper sources can be fitted at once. One paper type need not be unloaded to temporarily load another.

Uniquely, the new ESC/P2 printers are all designed to use the same cut sheet feeders. Naturally, different width feeders are required for the narrow and wide carriage printers but the LQ-570 and LQ-870 both use the same accessories. Epson will extend common accessories to new machines, at considerable savings – the 80 column feeders are priced at £49, while the wide carriage feeders cost £79.

Of course, all of this would just be so much gimmickry if the printers themselves were not up to scratch. Fortunately that is far from the case. The more expensive LQ-870 was put through its paces for *BAU* and it performed admirably. This machine is fast, well up to the speed of the fastest rival machines at this price.

There are two draft modes – one gives slightly better print quality than the other but is a touch slower. The difference in quality is small and most users will stick with the fastest mode that can produce text at 174 characters per sec, or about four pages per minute.

What's more, the quality of print is without equal in the world of dot-matrix printing. Draft print is quite legible and the NLQ print, in all nine fonts, would match many laser printers.

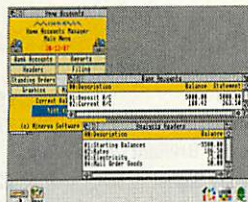
The LQ-870 is an extremely capable machine. Quite apart from the additions that ESC/P2 provides, it is a solid, high performance printer with many novel but eminently useful design features. The LQ-570 and LQ-1070 are about 25 per cent slower but otherwise found to be up to the same standard.

CONCLUSION

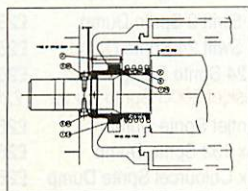
It is unlikely that ESC/P2 will win over wealthy, potential laser printer buyers to dot-matrix printers, but it is certain that the improvements found in the new standard make these new printers highly desirable items to those who cannot afford to take the laser route.

For BBC micro owners in particular, the improved graphics and the whole new world of scaleable fonts mean that the ESC/P2 printers are a viable alternative to page printers. For that reason alone, the development of the new standard has been well worth the effort and should prove a popular choice.

For more details on ESC/P2, and the new range of printers, call Epson on (0442) 22722.



HOME ACCOUNTS



CADET



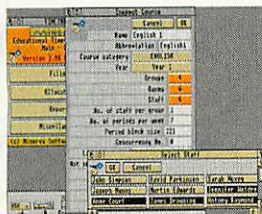
DESKTOP OFFICE



PRIMEART



ATELIER



TIMETABLER



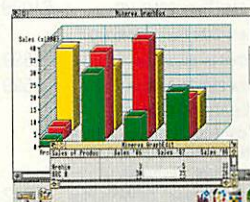
PRIMEART



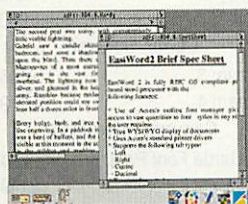
GRAPHBOX PROFESSIONAL



ANCESTRY



GRAPHBOX



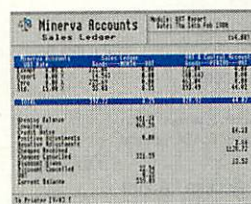
EASIWORD v2



ATELIER



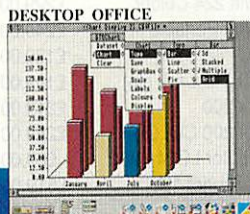
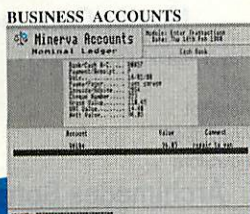
SYSTEM DELTA PLUS



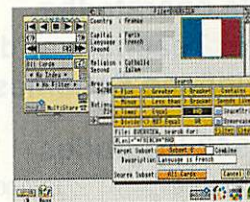
BUSINESS ACCOUNTS



FLEXIFILE



DESKTOP OFFICE



MULTISTORE v2

TAKE YOUR PICK!

QUALITY SOFTWARE

1992 CATALOGUE
AVAILABLE NOW!



MINERVA
SOFTWARE

MINERVA HOUSE, BARING CRESCENT, EXETER, EX1 1TL
Fax. (0392) 421762



TELEPHONE ORDERS
Tel. (0392) 437756





061 766 8423

Phone lines open :-
Mon - Fri 09.00 - 17.00

Sat 10.00 - 17.00

FAX: 061 766 8425

Acorn Hardware

A540 inc. 4Mb Ram, 120Mb HD,	
Arm3, Taxan 775	£2495.00
A5000 inc. 2Mb Ram, 40Mb HD,	
Arm3, Acorn Multiscan Monitor	£1499.00
A5000 Learning Curve	
as above c/w Audio Training Cassette,	
Guide to National Curriculum, Acorn	
Applications Suite, Pacmania,	
PC Emulator, Genesis, 1st word Plus,	
Acorn DTP	£1531.06
A5000 LC / Acorn Printer	
as above c/w Acorn JP150	
Inkjet Printer	£1765.96
A420/1 2Mb Ram, 20Mb HD	£1099.00
A410/1 c/w 2Mb Ram, 20Mb HD	
upgrade fitted by ourselves	£899.00
A3000 c/w 2Mb Ram fitted	£599.00
A3000 Learning Curve	
as above c/w Audio Training Cassette,	
Guide to National Curriculum, Acorn	
Applications Suite, Pacmania,	
PC Emulator, Genesis, 1st Word Plus	£642.29
A3000 LC / Acorn Monitor	
as above c/w Acorn Colour Monitor	£855.05
A3000 LC / Acorn Monitor /	
Acorn Printer	
as above c/w Acorn JP150	
Inkjet Printer	£1089.95
A3000 Special Access	
Acorn Serial Upgrade, Morley User/Analogue	
Expansion Card, Acorn Software Suite,	
Utilities Disc, SEMERC & ACE Special	
Needs Handbook	£679.00
A3000 Special Access / Acorn	
Colour Monitor / Stand	
as above c/w Acorn Monitor and	
Pres Monitor Stand	£899.00
Master 128	£399.00

**We operate the
Acorn Teachers and
0% Finance Schemes**

Please call for free information pack

A540 Upgrades

4Mb Ram Upgrade	£369.00
Taxan 795 VIDC Modes Disc	£7.50
Technical Reference Manual	£65.00

A5000 Upgrades

2Mb Ram Card	£110.00
Technical Reference Manual	£65.00

A400 Upgrades

1 Mb Ram	£35.00
2 Mb Ram	£65.00
3 Mb Ram	£99.00
20 Mb Hard Disc (ST506)	£145.00
40 Mb Hard Disc (ST506)	£245.00
5.25" Ext. floppy disc int.	£30.00
ARM 3 Upgrade (Aleph 1)	£289.00
Econet Module	£46.00
VIDC Enhancer	£29.00

A3000 Upgrades

1 Mb Ram (2 Mb in total)	£55.00
4 Mb Ram	£159.00
5.25" External f/disc buffer	£39.00
Serial Upgrade	£19.00
Serial Link Kit (BBC-Arc)	£14.00
User & Analogue Module	£46.00
User & Midi Podule	£46.00
VIDC Enhancer	£29.00

Expansion Cards

ArVis S-VHS Video Board	£295.00
ArVis S-VHS Encoder Board	£145.00
ArVis Video Graphics Board	£877.00
Chroma 345 Overlay Board	£389.00
Econet Module	£46.00
Ethernet Expansion Card II	£249.00
Floating Point Expansion Card	£449.00
Hawk V9 Video Digitiser	£199.00
I/O Expansion Card	£79.00
Midi Upgrade to I/O Card	£27.00
Midi Expansion Card	£65.00
ROM Expansion Card	£45.00
SCSI Expansion Card (Acorn)	£229.00

Standard Monitors

Acorn Colour	£199.00
Microvitec Cub 3000	£199.00
Philips CM8833 II	£199.00
Philips Mono (Green)	£85.00

All monitors come with free lead. State type of computer when ordering.

Multiscan Monitors

EIZO 9060SZ Flexiscan	£419.00
EIZO 9070SZ Flexiscan ^	£599.00
Taxan 775 Multivision	£389.00
Taxan 795 Multivision ^	£449.00
Taxan Viking II Mode 23	£749.00

^ comes with free VIDC enhancer.

Floppy Disc Drives

5.25" Single 40/80 no psu	£95.00
5.25" Single 40/80 with psu	£109.00
5.25" Dual 40/80 no psu	£185.00
5.25" Dual 40/80 with psu	£199.00
3.5" Single with psu	£85.00
3.5" + 5.25" 40/80 with psu	£209.00

Printers

Canon Bubblejet BJ-10e	£239.00
Sheetfeeder for BJ-10e	£59.00
Citizen 120D+	£114.00
Citizen Swift 9	£169.00
Citizen Swift 24e	£239.00
Colour Kit for above	£39.00
Citizen Swift 224	£199.00
Citizen Swift 224 Colour	£229.00
Citizen PN48 Portable	£249.00
Star LC20	£130.00
Star LC200 Colour (9 pin)	£189.00
Star LC24 - 200	£219.00
Star LC24 - 200 COLOUR	£259.00
Sheetfeeder for LC24 - 200	£69.00
Integrex Colourjet 132	£519.00
HP DeskJet 500C	£699.00
HP Paintjet	£695.00
Laser Direct (Qume)	£749.00
Laser Direct (LBP4 Hi Res.)	£899.00
Laser Direct (LBP8 Hi Res.)	£1289.00

Oak Products

Worra Winnie (SCSI)	
45 Mb Internal Hard Disc	£349.00
80 Mb Internal Hard Disc	£389.00
100 Mb Internal Hard Disc	£489.00
200 Mb Internal Hard Disc	£875.00
20 Mb External Hard Disc	£344.00
45 Mb External Hard Disc	£429.00
80 Mb External Hard Disc	£485.00
100 Mb External Hard Disc	£595.00
200 Mb External Hard Disc	£925.00
60 Mb Tape Streamer	£795.00

Econet

Broadcast Loader	£60.00
Level 4 Software	£199.00
Cable - 100m	£90.00
Econet Starter Kit	£80.00

Scanners

Flatbed A4 256 Grey SCSI (CC)	£849.00
Flatbed A4 with SCSI card	£949.00
Scan Junior Scanner A6	£169.00
Scanlight Senior Scanner A4	£329.00
Sheet Feeder for above A4	£105.00

Printer Drivers

Midnight Graphics

Citizen Swift 9 Sprite Dump	£26.04
Citizen Swift 24 Sprite Dump	£26.04
Epson 24 Sprite Dump	£26.04
HP Deskjet 500C Sprite Dump	£26.04
HP Paintjet Sprite Dump	£26.04
Integrex 132 Sprite Dump	£26.04
Integrex Colourcel Sprite Dump	£26.04
Juki 5520 Sprite Dump	£26.04
Star LC10 Sprite Dump	£26.04
Star XB24 Sprite Dump	£26.04
Star LC200 Sprite Dump	£26.04
Star LC24-200 Sprite Dump	£26.04

Ace Computing

Printer JX (Colour Dot Matrix)	£13.00
Printer DJ (Deskjet 500C)	£13.00
Printer PJ (Paintjet)	£13.00
Printer CA (Canon Colour)	£13.00

Electronic Font Foundry

BubbleJet - BJ10e/130e	£10.00
------------------------	--------

Cables

Arc - Monitor - 8833 inc sound	£8.65
Arc - Monitor - 8833 II inc sound	£8.65
Arc - Parallel Printer Cable	£5.00
Keyboard Extender 400/500	£7.50
Mouse Extender	£7.50
Replacement Mk I Mouse Cable	£6.50

BBC Software

Blob 1	£18.00
Blob 2	£18.00
Chick Chase (80 Track Only)	£15.00
E-Type	£13.00
Imogen	£9.95
Kourtyard	£9.95
Master Break	£10.39
Mini Office II	£17.35
Modem Master	£11.26
Play it Again Sam No's 1 - 16	£11.95
Reversals (80 Track Only)	£20.00
UIM	£14.95
Where's Blob	£18.00
White Knight	£18.00
White Magic	£11.26

Master Compact

Play It Again Sam No's 1 - 15	£13.00
UIM	£14.95
ViewPlot	£29.95
ViewSheet	£40.00
ViewStore	£45.00

Archimedes Software

4 Mation

Chameleon	£25.00
Craftshop 1	£29.00
Craftshop 2	£29.00
Jiglet	£29.00
Jigsaw	£29.00
Poster	£75.00
SmArt	£55.00
SmArtFiler	£35.00
Snippet	£29.00

Ace Computing

ArcLight	£43.00
Euclid	£40.00
Mogul	£17.00
Splice	£26.00
Tween	£26.00

Acorn Computers

1st Word Plus	£65.00
ANSI C (V 3)	£125.00
Acorn Desktop Publisher	£109.00
Desktop Assembler (V 2)	£119.00
Desktop C (V 4)	£185.00
Font Starter Pack	£39.00
Fortran 77	£99.00
ISO Pascal	£99.00
Newhall Font Pack	£39.00
PC Emulator / Free Shareware	£99.00
Symbol Font Pack	£39.00

TCP/IP Programers Pack	£50.00
TCP/IP Protocol Suite	£199.00
Twin	£25.00

Arxe Systems

MultiFS	£27.00
---------	--------

Beebug

Hearsay	£59.00
Ovation	£79.00

Brilliant Computing

Everyday Signs	£20.00
Joystick Games	£20.00
Streetwise	£20.00
Switch On	£20.00
Switch On Actions	£20.00
Teds Adventures	£20.00

Cambridge International Software

Fireball II	£10.00
Mah-Jong Patience	£15.00
Mental Maths	£15.00
Microdrive	£14.00

Clares Micro Supplies

Artisan 2	£45.00
Illusionist	£79.00

Interdictor

£10.00

while stocks last

Interdictor II	£25.00
ProArtisan	£70.00
Render Bender 2	£99.00
Rhapsody 2	£45.00
Schema	£90.00

Colton Software

Pipedream 3	£105.00
Pipedream 4	£179.00

Computer Concepts

AvanteGarde Font Pack	£24.00
ArtWorks	£149.00
Bookman Font Pack	£24.00
Compression	£39.00
Equisor	£39.00
Impression II Borders Disc	£12.00
Impression Business Suppliment	£39.00
Impression II Free Drawfile Disc	£125.00
Impression Junior	£70.00
Inter-Word	£29.00
Show Page	£99.00

Cygnus Software

Iron Lord	£14.00
Tower of Babel	£14.00
Twin World	£14.00

Dabs Press

Arc DFS	£22.00
---------	--------

Database Software

Fun School 2 6-8 year olds	£14.95
Fun School 2 over 8s	£14.95
Fun School 2 under 6s	£14.95
Fun School 3 under 5s	£19.95
Fun School 3 5-7 year olds	£19.95
Fun School 3 Over 7s	£19.95

Domark

Mig29 Fulcrum	£24.00
Mig29 Super Fulcrum	£32.00
Trivial Pursuit	£22.00

Empire

Pipemania	£16.00
-----------	--------

Electromusic Research

Creations Discs 1-8 ea.	£19.00
MIDI Analyser	£29.00
Microstudio	£78.00
Music Player	£35.00
RhythmBox	£29.00
SoundSynth	£39.00
Studio 24 Plus	£149.00

ESM

Desktop Folio	£79.00
---------------	--------

Hybrid	
Elite	£32.99
Icon Technology	
EasiWriter	£115.00
Krisalis Software	
Chuck Rock	£19.00
James Pond	£20.00
Lemmings	£20.00
Mad Professor Mariarti	£14.00
Manchester United Europe	£19.00
World Champ. Boxing Manager	£19.00
World Championship Squash	£18.00

Lingenuity	
HotLink Presenter	£34.00
Presenter Story	£129.00
Presenter II	£29.00

Longman Logotron	
ArcComm 2	£54.00
Landmarks No's 1 - 4	£19.00
Magpie	£54.00
Notate	£55.00
Numerator	£60.00
Pendown	£54.00
Pendown Outline Fonts	£18.00
Pinpoint	£69.00
Revelation 2	£99.00

Magnetic Scrolls	
Collection 1 (3 Adventures)	£29.50
Wonderland	£24.00

MicroPower	
Chess 3D	£14.00
Zelanites	£17.35

Midnight Graphics	
ClipArt 1 over 480 images	£29.95
ClipArt 2 over 350 images	£29.95
Tracer	£52.13

Minerva Software	
Serious	
Ancestry	£59.00
Atelier	£69.00
Desktop Office	£79.00
Easiword	£19.00
Flexifile	£89.00
Graphbox	£60.00
Graphbox Professional	£109.00
Home Accounts	£35.00
Multistore II	£179.00
PCAccess	£19.00
PrimeArt	£69.00
Timetabler	£599.00
Games	
Battletank	£13.00

Bughunter in Space	£13.00
Bug Hunter / Moon Dash	£13.00
Casino	£13.00
Caverns	£13.00
Family Favorites	£13.00
Freddy's Folly	£13.00
Hoverbod	£13.00
Ibix the Viking	£13.00
Jet Fighter	£13.00
Maddingly Hall	£13.00
Orion	£13.00
Redshift	£13.00
Talisman	£13.00
Thundermonk	£13.00

Northwest SEMERC *	
Conform Keyboard Software	£15.00
My World	£15.00
Oldham Keyboard	£125.00
Phases - Borders disc	£7.50
Phases - Christmas disc	£7.50
Phases - Clip Art 1	£7.50
Phases - Very Hungry Caterpillar	£7.50
Phases 2	£15.00
Simple Stuff Maths	£7.50
Simple Stuff Sampler	£7.50
Simple Stuff Skeletons	£7.50

* Please add £2.50 P&P to SEMERC Software

Oak Solutions	
Archimedes BASIC Compiler	£79.00
Carousel	£34.00
Disc Sharer	£119.00
GenIndex	£25.00
Genesis	£40.00
Genesis Plus	£69.00
Genesis II	£99.00
Oak Recorder	£29.00
Parametric Design Tool	£359.00
Printer Spooler	£65.00
Remote Logon	£34.00
Worra Battle	£14.00
Worra Plotter	£24.00
WorraCAD	£74.00

Sherston Software	
!Draw Help	£15.95
!Help	£7.95
Animated Alphabet	£19.00
Arventure	£25.00
Dreamtime	£20.00
Farm	£19.00
Fleet Street Phantom	£23.00
Mapventure	£23.00
Microbugs	£25.00
Nature Park Adventure	£24.50
Selladore Tales	£24.00

Space Mission Mada	£23.00
Stig of the Dump	£22.00
Teachers Cupboard	£24.50
Teddy Bears Picnic	£23.00
Viewpoints	£35.00
Wizards Revenge	£17.00
Worst Witch	£21.50

Silicon Vision Ltd	
ARC-PCB	£149.00
ARC-PCB Professional	£299.00
Data Vision	£119.00
FILM-Maker	£70.00
Financial Accountant	£199.00
GerberPlot	£89.00
Realtime Solids Modeller	£149.00
RiscBASIC	£119.00
RiscFORTH	£119.00
RoboLOGO	£70.00
ShareHolder	£149.00
SolidCAD	£119.00
SolidTOOLS	£299.00
SolidsRENDER	£119.00
SuperDump	£25.00
SuperPlot	£29.00

SIMMIS	
Flight Sim Toolkit	£38.00

Superior Software	
Air Supremacy	£14.00
Conqueror	£15.00
Hostages	£14.00
Master Break	£14.00
Repton 3	£14.00
Speech!	£14.00
Superior Golf	£14.00
Zarch	£14.00

The Data Store	
FontFX	£9.95
ShapeFX	£9.95

The Fourth Dimension	
Apocalypse	£14.00
Arcade Soccer	£14.00
Articulate	£14.00
Arctist	£14.00
Boogie Buggy	£14.00
Break 147 / Superpool	£18.00
Cataclysm	£18.00
Chocks Away 2	£15.00
Chocks Away Extra Missions	£14.00
Chocks Away 2 + Ext. Missions	£27.00
Drop Ship	£13.00
E-Type Compendium	£18.00
E-Type Designer	£13.00
E-Type Extra 100 miles	£13.00
Enter The Realm	£18.00
Holed Out Compendium	£18.00
Holed Out - Designer	£13.00
Holed Out - Extra Courses Vol 1	£13.00
Holed Out - Extra Courses Vol 2	£13.00
Inertia	£14.00
Man at Arms	£14.00
Nevryon	£14.00
Pandora's Box	£18.00
Powerband	£14.00
Pysanki	£14.00
Saloon Cars	£18.00
The Olympics	£14.00
The Real McCoy 1	£20.00
The Real McCoy 2	£20.00
The Wimp Game	£14.00
U.I.M	£18.00
White Magic	£14.00
White Magic 2 inc Designer	£14.00

The Serial Port	
ARCTerm 7	£69.00
Investigator II	£22.00
Joystick Interface	£23.00
Tracker	£37.00

Triple R Education	
Converta-Key	£14.00
Data Word	£14.00
Money Matters	£14.00
Picture Book	£14.00
Target Maths	£14.00

Books (No VAT)

C: A Dabhand Guide	£14.95
Archimedes Assembly Language	£14.95
Archimedes Operating System	£14.95
The above books have accompanying discs add £5 for 5.25", £7 for 3.5"	
A3000 Technical Guide	£29.95
Acorn DTP Advanced U.G.	£14.95
!Help - Sherston	£7.95
BASIC V: A Dabhand Guide	£9.95
BBC Basic Guide (Acorn)	£19.95
DTP Seeds (4Mation)	£8.45
M128 Ref. Man.Pts 1&2 (ea.)	£14.95
RISCOS PRM's	£79.00
First Word Plus V2	£10.00
Acorn DTP	£10.00
ANSI C Version 3	£17.00
Assembler Release 2	£25.00
Desktop C Release 4	£25.00
Desktop Development UG	£25.00

Hours of Opening

Monday - Friday 9.00 a.m. - 5.00 p.m.
Saturday 10.00 a.m. - 5.00 p.m.
Lunch 1.00 p.m. - 1.30 p.m.

How to find us



Important Facts

- **NO Minimum Order Value**
- **NO Carriage Charges in Mainland UK**
- **ALL Goods Despatched within 24 Hours, subject to stock levels**
- **Acorn Qualified Dealer**
- **Acorn Service Centre**
- **Hotline Support on all Hardware and Software purchased from us**

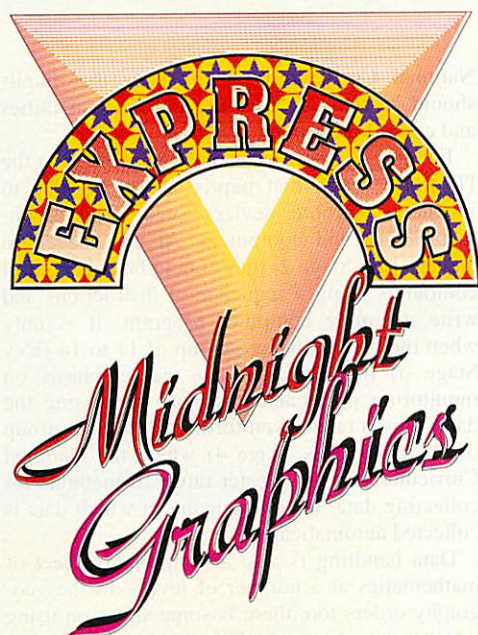
Terms & Conditions

TERMS: UK residents add 17.5% VAT to all prices, except books. Delivery FREE on all postal items in the UK. Foreign orders, no VAT, carriage at cost. (quotations available). Access/Visa cards accepted. Dabhand Computing Ltd. is a Qualified Acorn dealer. Official orders accepted from public sector/education/PLCs, otherwise cash with order. Tender invitations welcome. Callers welcome. We are 800 yds north of J17, M62. Prices subject to change without notification. Goods offered subject to being unsold.



**DABHAND
COMPUTING**

DABHAND COMPUTING LTD
5 Victoria Lane
Whitefield
Manchester, M25 6AL



The Ultimate Graphical Presentation Package

Available End March 1992 please call for Launch Pack and Sample disc - Price £51.02

CHRIS DRAGE
looks at a range
of data loggers
designed to
monitor the
environment

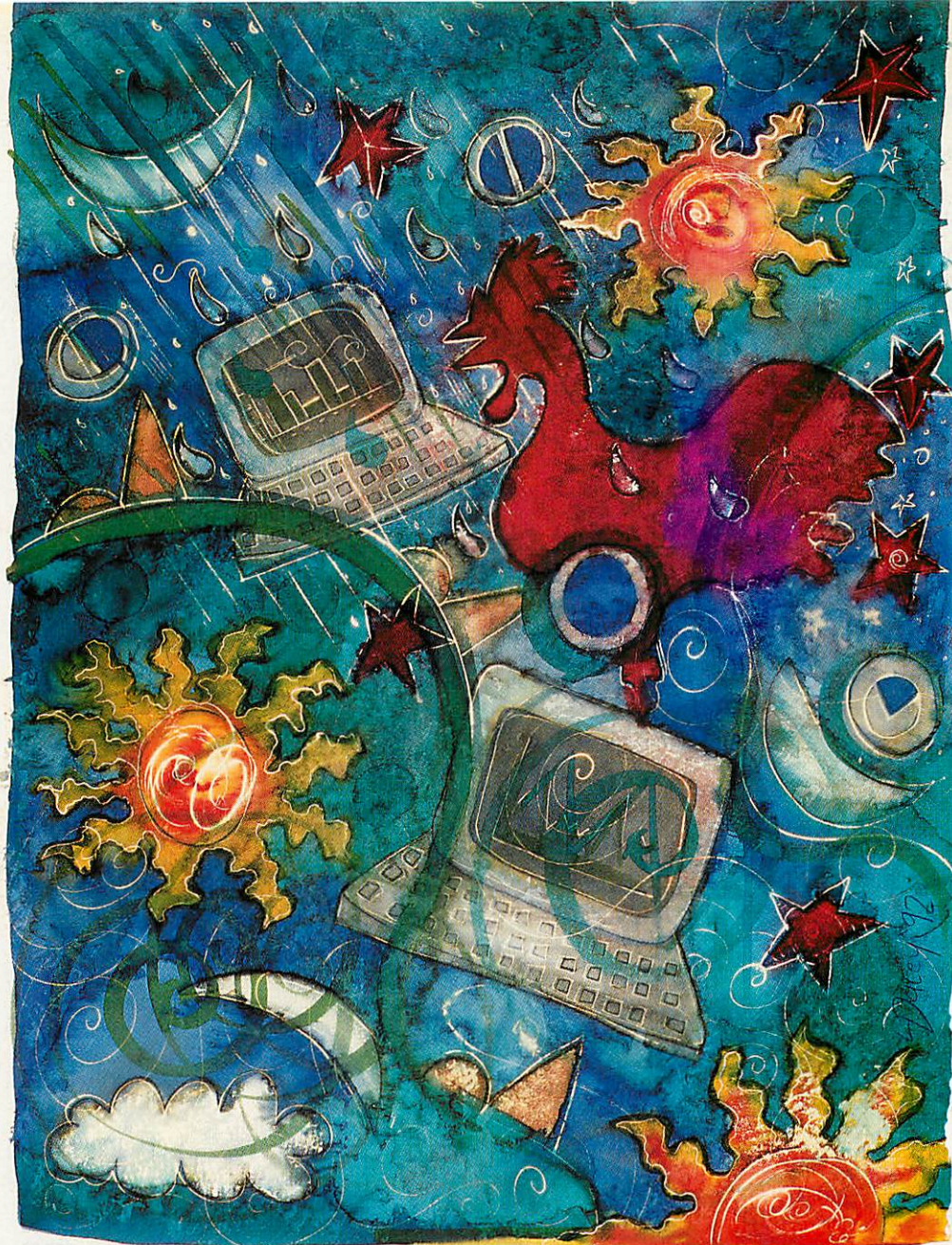


ILLUSTRATION BY LINDA DACEY

WINDS OF CHANGE

Anyone who has ever harboured a secret desire to be a weatherman will probably find that data loggers are a joy to use. Or, on a more serious note, data loggers are great for school projects, and can monitor a range of environmental changes such as temperature, wind speed and many more. Some can even monitor the number of footsteps across a room.

There are many different types of data loggers, available across the range of Acorn machines, but they all do basically the same thing. A data logger takes sensor readings and stores them in memory. There are in fact two types: digital sensors, such as on/off switches, can be used to count events, while analogue sensors, such as thermistors, detect subtle changes in the environment. There are a wide range of sensors available, allowing you to monitor all manner of chemical, physical and biological phenomena.

As far as schools are concerned, data logging can play its part in fulfilling the demands of the

National Curriculum which states that pupils should be able to "measure physical quantities and control movement."

For five to seven year olds (Key Stage 1) the IT orders stress that pupils should be able to instruct electronic devices such as programmable toys and computers. At ages seven to eleven (Key Stage 2) they should be able to control computers using a sequence of instructions and write a simple computer program. It is only when they reach the age group of 11 to 14 (Key Stage 3) that there is any real emphasis on monitoring physical events and processing the data. This is taken even further for the age group of 14 to 16 (Key Stage 4) where the National Curriculum cites a greater range of methods for collecting data, including many in which data is collected automatically.

Data handling is also an important aspect of mathematics at a number of levels. In the geography orders too, there is some stress on using weather data, for example for regional analysis –

an ideal task for a data logging system. However the most important factor for teachers will probably be that all important question – will it work on my machine? In this case, the answer is yes. If you have a BBC B or Master 128 then you do not need anything other than a data logger and the necessary sensors. A3000 owners must, in addition, have a serial upgrade fitted, costing about £20, and the A310/400 series needs an Acorn I/O module. As for the range of data logging devices on the market, there are quite a few to choose from.

BASIC SKILLS

For younger children and older children with learning difficulties there is The Measuring Box. This system is made up of a small plastic box which holds three, surface-mounted sensors, a large pressure mat, a disc of software for BBC B/Master 128 computers and a manual. It allows four different items to be recorded: sound level with a small microphone, light level with a light detector, air temperature with a calibrated thermistor and movement with the pressure mat.

The three programs provide current readings, graph plotting over one minute and recording over longer periods and the resulting graph may also be printed out. This system puts the emphasis on interpretation and not on the process of setting up and monitoring events. It encourages young children to use their imagination and to use facts in a precise manner.

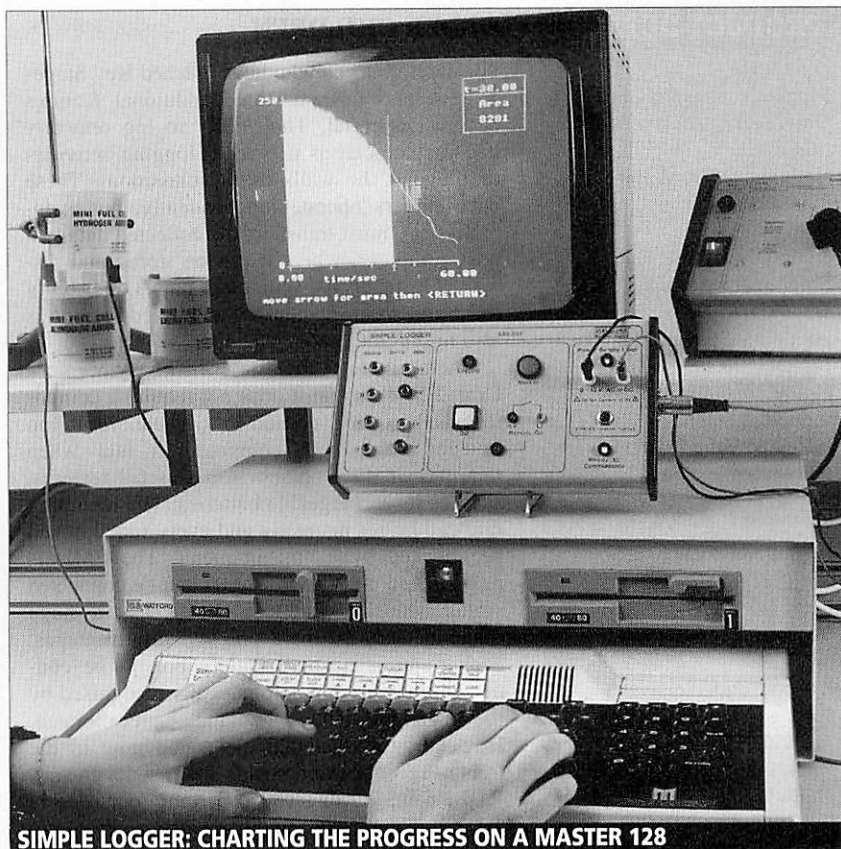
The robust First Sense Starter Kit avoids the need for complicated hardware, wiring or too many instructions and includes an interface, three sensors, connecting leads and suitable software. The system is designed to work with a range of computer systems found in schools requiring only the necessary lead and software and is aimed at the primary teacher who has no special computer skills.

The extensive range of sensors includes: light, temperature, sound, pressure, humidity, rotation and position. With up to four sensors being used simultaneously, rudimentary weather monitoring can be taken from the classroom window. Unusually, eight AA size batteries are required for the sensors which makes this unit more expensive to run. The sensors are very robust and safe but are quite bulky as they are designed to be hand-held. All sensors are self-identifying and splash-proof with the temperature and light sensors being waterproof as well.

The software enables children to see changes in the environment on screen as they happen, with the results being recorded as a bar chart, a line graph or as simply a table of readings. It also has the ability to build up a daily weather file including brightness, temperature, humidity, pressure and wind speed. If you can afford it First Sense is a super system.

MOVING ON

At the next age range, Measure It has been designed with the Key Stage 2 firmly in mind. It includes an interface box, two temperature sensors, a light sensor and a thumb switch on a lead. The hardware is simple, well designed and robust enough for little fingers. Measure It uses the BBC/Master computer during all its activity and is not able to log data remotely.



SIMPLE LOGGER: CHARTING THE PROGRESS ON A MASTER 128

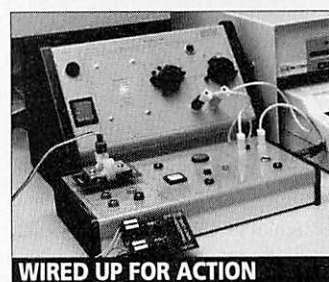
Two other programs are recommended for use with Measure It hardware. The first, *Toolkit* will be familiar to many secondary schools. Another package called *PriSM* is particularly well suited to primary science activity when combined with Measure It. Indeed, the *Intro-PriSM* program introduces the concepts of data logging extremely well and the speaking thermometer is delightful and is useful for partially sighted children.

Sense is a low-cost version of Sense and Control, which is aimed at older children. (We will look at Sense and Control in more detail later.) Sense can be used successfully in multi-subject experiments at all levels. It has six inputs labelled one to four and A and B. Being a serial device, Sense connects equally well with a BBC B/Master 128 or an Archimedes (with an analogue port added).

The range of self-identifying sensors is steadily growing, with all the popular ones available: light, temperature, position, light gates, pressure mat and light switch. Software for use with Sense includes *Practical Science With Microcomputers*, or *Intro-PriSM/PriSM*.

The NCET Sensing Science Pack will appeal to primary teachers looking to introduce IT into their science teaching. The pack comprises the Sense interface, *Intro-PriSM* and *PriSM* software, two light sensors, two temperature sensors, a turn sensor, a general digital sensor and an input connecting block. This all adds up to make this pack the most comprehensive introduction to data logging.

Although they have much in common, Sense differs from Sense and Control in one important way – remote data capture is not possible as Sense can only be used when connected to a computer and so limits older children.



WIRED UP FOR ACTION

PRODUCT DETAILS

Product: The Measuring Box
Supplier: Panthera, 5 Cedar Close, Beeston, Nottingham NG9 2HA
Machines: BBC B, Master 128
Price: £60

Product: First Sense, EMU
Supplier: Philip Harris
Tel: (0934) 413063
Prices: First Sense Starter Kit – £232, interface only £125.
 EMU – £226 (including connecting lead)
Machines: BBC B/Master Archimedes

Product: Measure It
Supplier: Resource
Tel: (0302) 340331
Price: £85
Machines: BBC B/Master

Product: LogIT
Supplier: Griffin & George
Tel: (0509) 233344
Prices: £185 (starter pack), £29.90 (connecting lead and Link Pack software), £9.90 (mains power supply unit)

Product: Simple Logger
Supplier: Unilab
Tel: (0254) 681222
Prices: £133 (including software), £7.80 (input card for Simple Logger) £56.03 (20v bench power supply unit)
Machines: BBC B/Master, Archimedes

Product: Sense and Sense and Control
Supplier: Educational Electronics
Tel: (0525) 373666
Prices: Sense £39 including software, NCET Sensing Science pack: £175, Sense and Control £179 including pressure mats. (The full data logging package £339).

Product: Sense It
Suppliers: Deltronics
Tel: (0269) 843728
Price: £96
Machines: BBC B/Master

All prices exclude VAT.

OLDER CHILDREN

For older children who have reached Key Stages 3 to 4 and beyond, three additional features become essential. The ability to log remotely becomes crucial as it extends logging activities far beyond the walls of the classroom. These data loggers operate independently, but eventually they must transfer their collected data to a host computer, where it can be stored and displayed for analysis. With older pupils, the ability to be able to have snapshot and timed logging is also important.

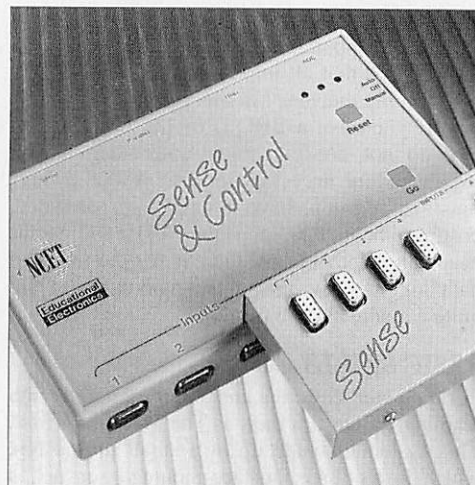
One attribute of the established Easy Memory Unit (EMU) is that it does not require a computer at all to set it up and to log data, yet it can transfer data to a computer as and when required. It does possess some useful features, such as its rechargeable batteries. The recording rate can be set manually and every function can be checked by a built-in meter. The EMU is reliable and up to four sensors can be connected simultaneously. Although EMU has a huge range of sensors there are two disadvantages: each requires a small battery box to be connected, they are not automatically recognised by the software, nor are they precalibrated. However, the system looks dated now in the light of recent developments and it is not cheap.

The Simple Logger also permits four sensors to be connected simultaneously via 4mm sockets. It will accept many types of sensor from the Philip Harris type to simple sensors you connect up yourself with a length of wire. This logger is controlled by two push buttons and has four LEDs to indicate what is happening. The Simple Logger must be programmed from the host computer to accept the number of sensors and the rate at which readings are taken.

It can then log data in real time, with the computer software displaying the values as they are recorded. It can also log remotely. The software includes a useful tutorial which makes the technical nature of the software far more easy to follow. The system includes triggered logging (for example to start logging at a certain temperature) and event logging (to begin logging when a certain event has taken place). Full data analysis and display is possible.

Although the price tag is attractive there are a few drawbacks – there are no internal rechargeable batteries so an external power source is needed, manual calibration of sensors is a little archaic and there is no on-board clock to enable timed or preset recording of data.

Sense It Science Kit (Deltronics) comes complete with seven sensors, but is not a remote type and must remain linked to a computer. It can handle up to four, automatically calibrated sensors at once and is extremely sturdy, requiring no batteries in use. The software includes 10 menu-driven programs for collecting, displaying, analysing and storing data and printing out screens. It can also be configured to a simple version better suited to younger pupils. Comprehensive resources pupils are included in the pack and offer 10 experiments (at Key Stages 3 – 4) to be undertaken immediately. Sense It is affordable, simple to use, keeps the technology at arm's length, and provides many useful starting points for experiments.



TWO VERSIONS FOR DIFFERENT AGE GROUPS

LogIT is extremely light and small, and is a truly remote logger. The starter pack comprises a LogIT, light level and temperature sensors packaged in a plastic briefcase. LogIT can accommodate up to three sensors and possesses a serial port, a control interface and a power socket. The controls comprise two push buttons: green (to start) and red (to stop) each with an accompanying LED. Its major attribute is the ease with which data can be recorded – just press a button. LogIT automatically recognises sensors and gradually decreases the frequency of measurements until the stop button is pressed, 'sleeping' between readings to conserve battery life and serially downloading the data to the host computer. It can also be programmed for timed samples, event and triggered logging and can accept a variety of sensors.

LogIT is very versatile, portable logger which can be set up to be as simple or complex as you want it to be. It is well supported with human physiology software and weather adaptor set (for the Digital Weather Station) and progpack eproms on which LogIT programs can be stored semi-permanently. Fully Risc OS compliant logging software will be soon be available.

However, LogIT's biggest rival is Sense and Control which we mentioned earlier. It comes in two forms: the basic hardware and software kit or the full data logging pack which includes eight different sensors and comprehensive National Curriculum materials from NCET entitled *Practical Science with Microcomputers*.

Sense and Control can handle four analogue and two digital sensors (all self identifying), has a serial communication port, and BBC-style A to D User and printer ports. With its own batteries and micro processor, it can be a substitute I/O module on the Archimedes/A3000. Sound and Control communicates serially with the host computer from which it is programmed, before it can log remotely. New Risc OS compliant software provides timed, delayed and sensor activated logging. Its simplicity will be appreciated by non-computer literate teachers, yet the system can be put to quite sophisticated logging tasks. In addition, it can also double as a control interface to environments via the Power Sac controller. Importantly, for schools, the Sense/Sound and Control offers coherence and continuity across the age ranges.

Archimedes

	BASIC	COLOUR
A3000...see below...see below...see below		
A410/1	\$809.10	\$1016.10
A420/1 see below...see below...see below		
A5000	\$999.00	\$1499.00
A540	\$2245.50	\$2452.50

TELEPHONE SUPER SPECIAL

A3000 Basic Model
SUPER Price £CALL#
OR !
A3000 Stereo Colour Model
SUPER Price £CALL#
OR !
A420/1 Stereo Colour Model
SUPER Price £CALL#

WE ARE OPEN ALL DAY SATURDAY
WHY NOT VISIT OUR SHOWROOM !
WE WILL TRY TO BETTER ANY OTHER
DEALER PRICE ... PLEASE TELEPHONE

The Learning Curve
A3000 Model
Basic £629.10 Colour £853.20
A420/1 Model
Basic £1169.10 Colour £1367.10

OUR PRICES
DO NOT
INCLUDE V.A.T.

Master 128	\$359.10
Cambridge Z88 Lap Top	\$189.95
Panasonic KX P1081	\$146.95
Citizen Swift 9	\$157.00
Citizen Swift 24	\$260.83
Citizen Swift colour upgrade	\$34.20
Star LC10	\$155.40
Star LC10 Colour	\$294.35
Philips 8833 Colour	\$195.00#
Philips 7522 Amber Screen	\$69.52
Philips 8832 Colour	\$199.67
Ahktar 40/80 400K Sgls no PSU	\$99.00
Ahktar 40/80 800K Dual no PSU	\$199.00
Ahktar 40/80 400K Sgls & PSU	\$114.53
Ahktar 40/80 800K Dual & PSU	\$221.70

OAK COMPUTERS

20 Mb Ext HDisc (B & Master)	\$517.75
SCSI 20Mb Add HDisc A3/410	\$413.25
SCSI 20Mb Ext HDisc A3000	\$508.25
SCSI 45Mb Add HDisc A3/410	\$527.25
SCSI 45Mb Ext HDisc A3000	\$622.25
SCSI Card for A3000	\$189.05
SCSI Card for A3/410	\$189.05

WE ARE LICENSED CREDIT BROKERS AND CAN OFFER
FINANCE ON COMPUTERS AND SOFTWARE. WE
OPERATE THE ACORN TEACHER AND ACADEMIC
SCHEMES FOR TRAINING AND FINANCE. PLEASE



0457 865953



0457 869917

COMPUTECK Ltd.

Dinting Lane Industrial Estate
Glossop
Derbyshire SK13 9NU
Visa-Master-Lombard Cards
0457 869917

We specialise in "Trading In" and
buying Used Hardware & Software

Post and Packing Charges
\$1.00 for small, \$2.45 for medium items.
Expensive products \$9.00 for courier

ACORN/STO

Desk Top Publisher (A)	\$119.20
Lisp (BMC)	\$16.10
Logistix (A)	\$89.10
Micros in Business (BMC)	\$34.75
Twin (A)	\$26.10
View 3.0 (B)	\$41.60
View Index (BMC)	\$10.40
View Plot (BMC)	\$20.83
View Professional (BMC)	\$55.51
View Sheet (BMC)	\$41.60

COMPUTER CONCEPTS

Inter-Base (BMC)	\$48.00
Inter-Chart (BMC)	\$25.60
Inter-Sheet (BMC)	\$39.20
Inter-Word (BMC)	\$39.20
Inter-Sheet (A)	\$23.20
Inter-Word (A)	\$23.20
Laser Direct Laser Printer	\$949.05
Spell Master (BMC)	\$41.03
Impression II (A)	\$152.09
Impression Junior (A)	\$80.95

CLARES MICRO SUPPLIES

Alpha Base (A)	\$39.09
Artisan 2 (A)	\$46.91
Toolkit (A)	\$39.09
Interdictor 2 (A)	\$27.35
Knowledge Organiser (A)	\$46.91
Fontwise package (BMC)	\$23.47

IMPACT SOFTWARE

The Real McCoy (A) Discs	\$23.44
Man at Arms (A)	\$15.62
Holed Out (A)	\$15.62
Apocalypse (A)	\$23.44
Nevron (A)	\$15.62
The Olympics (A)	\$15.62

PRES

Adv. Control Panel (BMC)	\$27.90
Adv. Disc Investigator (BMC)	\$23.52
Adv. Disc Toolkit (BMC)	\$27.90
Adv. File Manager (BMC)	\$22.51

PRES Archi products all discounted !!

MINERVA SYSTEMS

System Delta+Card Index (BM)	\$50.83
System Delta Plus (A)	\$62.56
Atelier (A)	\$78.22

DABS PRESS

Master Guide Book	\$11.66
Viewstore/Sheet Book	\$11.66
Archimedes DFS Disc	\$23.44
"C" A Dabhand Guide	\$13.45
Z88 A Dabhand Guide	\$13.45
Archimedes Beginners Guide	\$8.95

Winter Clearance

Goupil Golf Laptop/Desktop PC 1meg 286	
40meg H/disc VGA Retail \$3500.00	
SAVE \$2,700.00..... SALE Price \$800.00	
Amstrad PC2086HD 12" VGA colour	
30meg H/disc Retail \$899.00	
SAVE \$200.00 SALE Price \$699.00	
Amstrad PC2086SD Mono monitor	
3.5" Floppy Drive Retail \$499.00	
SAVE \$50.00 SALE Price \$449.00	
Western Digital 30meg H/Card \$249.00	
SAVE \$50.00 SALE Price \$199.00	

This advert contains just
a few of the items we have
Please telephone or send a
SAE for our FULL price lists

PRICES MARKED # ARE CHEQUE
or CASH ONLY NO CREDIT CARDS

USED STOCK SELECTION from COMPUTECK Ltd.

COMPUTERS & HARDWARE

Acorn	BBC B 1770 DFS Series 3	170.00	Misc.	Control Logo (C) Disc	12.00
Acorn	BBC B 1770 DFS Series 4	170.00	Misc.	Creation Discs (A) EMR & discs	26.04
Acorn	BBC B 1770 DFS Series 7	200.00	Misc.	Diagram (B) Disc Pineapple	21.70
Acorn	BBC B 8271 DFS Series 3	170.00	Misc.	Gemini Compo Pack (B) Disc	12.00
Acorn	BBC B 8271 DFS Series 4	170.00	Misc.	Graph Builder (BM) Disc	10.00
Acorn	BBC B 8271 DFS Series 7	200.00	Misc.	Graphics Pack (B) Tape Salamander	3.00
Acorn	BBC B 128 Computer	220.00	Misc.	Icon Art Master (BM) Disc	12.00
Acorn	Master 128	250.00	Misc.	Instant Recall D/base (B) tape	6.00
Acorn	Master 512 Board	149.00	Misc.	Invoicing (B) Disc	10.00
Acorn	Master Turbo Board	70.00	Misc.	Logo Extension (C) Disc	7.78
Misc.	Z80 Second Processor	90.00	Misc.	Maths Age 4-14 (C) Disc	15.00
Misc.	Quadrom Multiscan 14	225.00	Misc.	McVid Graphics (BMC) Disc	6.00
Misc.	Zenith Amber Screen	40.00	Misc.	Merlin Database/Scripte (B) ROM	17.34
Misc.	Brother HR40 Daisy Wide Carr.	346.96	Misc.	Micro Maths GCSE (C) Disc	15.00
Cumana	S/Drive 40/80 5.25	80.00	Misc.	Music Collection (B) Disc	8.00
Misc.	Dual Drive 801 no PSU	120.87	Misc.	Music Logo (C) Disc	12.00
Misc.	Maxwell 20meg Hard Drive (BM)	180.00	Misc.	Rival Perfect Maths Pack (B)	10.00
Misc.	Single Drive 40/80 inc PSU	70.00	Misc.	Record Keeper (B) Tape	4.00
Misc.	Hard Disc 20 meg A3000	295.00	Misc.	Science & Technology (B) Disc	12.00
A M S	AMX Mouse	20.00	Misc.	ScreenPrint (B) ROM	10.00
A M S	Mouse (C)	20.00	Misc.	Share And Synergy (B) Disc	26.04
Acorn	Data Recorder ALF03	15.00	Misc.	Share + ROM (B)	20.00
Acorn	Master Econet Module	30.00	Misc.	Space Mission Nada (C) Disc	10.00
Acorn	Master ROM Cartridge	8.00	Misc.	Spanish level B (BM) Disc	10.00
Acorn	Prestel Adapter (BM)	40.00	Misc.	Spy (B) ROM	12.00
Beebug	Serial Link to BBC (A) Disc	12.00	Misc.	U Connect (A) Disc	15.00
Misc.	8K SRAM Module	12.00	Misc.	Visual-Viewdata (B) ROM	20.00
Misc.	Atari Trackerball (BM)	25.00	Misc.	Vu-Calc (Pison) (B) Tape	8.00
Misc.	Chroma 250 Genlock Wild/Vison	295.00	Misc.	VU-File (B) Tape	10.00
Misc.	Gratpad	60.00	Misc.	Welcome FORTH (B) ROM HCOS	18.00
Misc.	Marconi Tracker Ball (BM)	25.00	Misc.	Wizards Advent (C) Disc	10.00
Misc.	Printer Sharer 6 Comps to 1 Pr	160.00	Misc.	Xmas Cards (A) EMR Disc	4.30
Misc.	Term Modem 2000 in Software	60.00	Misc.	ZOOM Moch. Code Monitor (B)	10.00
Misc.	Terril printer Sharer Box	23.00	Misc.	Chaffeur (C)	8.00
Misc.	Timer Kit	8.00	Misc.	Illustrator DTP (BM) Disc	15.00
Misc.	Time Warp RTC Technomatic (B)	13.87	Misc.	Illustrator Paintbox (C) Disc	10.00
Misc.	3.5 Second Drive A3000	95.00	Misc.	Genie Junior (M) Disc	12.00
Misc.	Core dual 2 x 16K cartridge	8.00	Misc.	The Publisher (C) ROM + fonts	29.95
Misc.	Anamouse (BM)	20.00	Misc.	Microtel Terminal (B) ROM	8.00
Misc.	Digimouse	20.00	Misc.	Admnc 1770 DFS (B) ROM	20.00
Misc.	System Housing A3000	49.00	Misc.	Speech (C) Disc	8.00
Misc.	Cartridge System for BBC B	13.00	Misc.	Beeborn (B) ROM	20.00
Misc.	Cartridges for ROMs	3.00	Misc.	Colour Art (B) Disc	6.00
Misc.	Replay 8271 BBC B	27.00	Misc.	ConQuest	18.00
Misc.	16K Disc RAM Board (B)	20.00	Misc.	Diagnostic Disc (B) Disc	10.00
Misc.	Beeb Video Digitiser	60.00	Misc.	Wattford ROM (B) ROM	15.00
Misc.	Quest Mouse	20.00	Misc.	Dumpout 3	12.00
			Misc.	NLS Designer (BM) ROM	12.00
			Misc.	Office Mate (B) Disc	6.00
			Misc.	Quest Print (BM) ROM	20.00
			Misc.	View Printer Driver ROM	25.00
			Misc.	Wapping Art (B) Disc	9.00
			Misc.	Wapping Fonts 1&2 (BM) Disc	12.00

BOOKS

Acorn	Ref Manual Part 2 (M)	10.00
Acornsoft	View Ref Manual	6.00
Acornsoft	Toolbox 2 and tape	5.00
Dabs Pres	Master 512 Guide and Disc	8.00
Misc.	30 Basic Spectrum	3.00
Misc.	Admnc Basic ROM UGuide/C Photo	8.00
Misc.	Assembly Long Prog 1 Birmbaum	4.00
Misc.	Beyond Basic / R Freeman	4.00
Misc.	Brain Teasers for BBC	3.00
Misc.	Creative Graphics John Cornie	4.00
Misc.	Data Processing/Hardw. & Progm	0.00
Misc.	Exploring Adventures / Gerrard	4.00
Misc.	Exploring FORTH / Bishop	4.00
Misc.	Graphics on the BBC	4.00
Misc.	Pascal Programming Huggins	3.00
Misc.	Proc and Functions BBC	3.00
Misc.	Progming with Graphics/Marshall	3.00
Misc.	Writing Adventure Games	3.00
Misc.	Writing Educ Progs BBC & Elect	5.00

SERIOUS SOFTWARE

A M S	AMX Super Art (M) Disc	25.00	Incentive	Moon Cresta (B) Disc	6.00
A M S	Extral Extral (BM) Disc	12.00	Mandarin	Lancelot (BM) Disc	6.00
A M S	Max (B) ROM	10.00	Micro Pow	Dr Who & Mines (M+B) Disc	6.00
A M S	Stop Press Discs (M)	25.00	Micro Pow	Killer Gooch (B) Disc	6.00
A M S	Super Art (C) Disc	25.00	Misc.	Home Entertainment (B) Disc	6.00
A M S	Utilities (B) Disc	7.00	Misc.	Jump Jet (B) Disc	6.00
Acorn	PC Emulator (A) Discs	60.00	Misc.	Kourtyard (B) Disc	4.00
Acornsoft	Basic Editor (BMC) ROM	15.00	Misc.	Skirmish (C) Disc	6.00
Acornsoft	BCLP ROM (B)	31.31	Misc.	Sport Spectacular (B) Disc	6.00
Acornsoft	GXR Rom (B) ROM/Tape	16.00	Superior	Around World (BM) Disc	4.00
Acornsoft	Hi - View (B) Disc	22.00	Superior	Collection Vol 1 (C) Disc	6.00
Acornsoft	ISO Pascal (BM) ROMs	60.00	Superior	Collection Vol 2 (C) Disc	6.00
Acornsoft	Logistix (A) Disc	60.00	Superior	Conqueror (A) Disc	14.00
Acornsoft	Printer Driver Gen. (BM) Disc	6.00	Superior	Edie (C) Disc	9.00
Acornsoft	View Spell (BM) ROM & Disc	21.74	Superior	Grand Prix (C) Disc	6.00
Acornsoft	View Store (BMC) ROM	30.00	Superior	Grand Prix Con Set (BM) Disc	4.00
Acornsoft	Workshop (B) Disc	6.00	Superior	Hostages (C) Disc	7.00
BBC Pubs	Drawing (B) Tape	3.39	Superior	Last Ninja (BM) Disc	6.00
BBC Pubs	VU-Type (B) Tape	6.00	Superior	Palace of Magic (C) Disc	7.00
Beebug	C Stand Alone Generator	12.00	Superior	Perplexity (C) Disc	7.00
Beebug	Design (B) Disc	10.00	Superior	Play It Again Sam (C) Disc	7.00
Beebug	Emxon II (B) ROM	15.00	Superior	Predator (BM) Disc	6.00
Beebug	Harshay Chars (B) Disc	6.00	Superior	Quest (BM) Disc	4.00
Beebug	Icon Master (BM) ROM	15.00	Superior	Ravenskill (BM) Disc	4.00
Beebug	Masterfile II (B) Disc	12.00	Superior	Repton Thru Time (C) Disc	7.00
Beebug	Masterfile II (C) Disc	12.00	Superior	Sam 11 (C) Disc	7.00
Beebug	Murom (B) ROM	15.00	Superior	Sam 13 (C) Disc	7.00
Beebug	Paintbox (B) Disc	8.00	Superior	Sam 14 (C) Disc	7.00
Beebug	Primwase (BM) Disc	15.00	Superior	Sam 2 (C) Disc	7.00
Beebug	Quickcalc (B) Disc	8.00	Superior	Sam 3 (C) Disc	7.00
Beebug	Quickcalc (C) Disc	8.00	Superior	Sam 4 (C) Disc	7.00
Beebug	Seuth (B) ROM	18.00	Superior	Sam 6 (C) Disc	7.00
Beebug	Sprites Utils (B) Disc	6.00	Superior	Sam 7 (C) Disc	7.00
Beebug	Teletext (B) Tape	3.50	Superior	Sam 8 (C) Disc	7.00
Beebug	Teletext Pack (B) Disc	7.00	Superior	Sam 9 (C) Disc	7.00
Beebug	Toolkit (B) ROM	12.00	Superior	Spycat (BM) Disc	6.00
Beebug	Toolkit Plus (B) ROM	18.00	Superior	Stykers Run (BM) Disc	4.00
Beebug	Vocab Tester (B) Tape	8.00	Superior	Superior Soccer (C) Disc	7.00
Beebug	Wordbase (B) ROMs	12.00	Tynesoft	Phantom (B) Disc	6.00
Clares	Artroom (C) Disc	15.00	Tynesoft	Summer Olympiad (B) Disc	7.00
Clares	Artroom (M) Disc	15.00	Tynesoft	The Big K.O. (B) Disc	4.00
Clares	Artroom (M) Disc	12.00			
Clares	Beta Base Utils (B) Disc	6.00			
Clares	Render Bender (A) Disc	39.00			
Comp Con	Disc Doctor (B) ROM	15.00			
Comp Con	Graphics (BM) ROM	15.00			
Comp Con	Gremilin (B) ROM	15.00			
Comp Con	Inter-Sheet (BMC) ROM	30.00			
Comp Con	Printmaster (BMC) ROM	15.00			
Dabs Pres	C Program Disc	4.00			
Dabs Pres	Hyperdrive (C) Disc	12.00			
Incentive	Graphic Adv Creator (B) Tape	10.00			
Minerva	Gamma Plot (A) Disc	40.00			
Minerva	Inter/View Link (C) Disc	10.00			
Minerva	Mail Shot Application (C) Disc	10.00			
Minerva	Sales Ledger (BM) Disc	26.04			
Minerva	Stock Management (C) Disc	26.04			
Mirror	Admin Extra (B) Disc	7.00			
Mirror	Real Street Editor (B) Disc	25.00			
Mirror	Real Street Editor (C) Disc	25.00			
Mirror	Sales & Graphics (B) Disc	10.00			
Mirror	Psychic Powers PSI-Q (B) Disc	6.00			
Mirror	Strike Force Hammer (B) Disc	6.00			
Misc.	1st Word Study Guide (A) Disc	10.00			
Misc.	3D Logo (C) Disc	12.00			
Misc.	ADE+ (M) 2xROM	30.00			
Misc.	ADE by Soft Smith	8.65			
Misc.	Archway (A) Disc	60.00			
Misc.	Bert Boot Maths 8-12 (C) Disc	10.00			
Misc.	Biscuits (BM) Disc/supersoft	8.65			

USED

BBC B, B+, MASTER & ARCHIMEDES

HARDWARE

PLUS SOFTWARE

IS NOW REQUIRED

PLEASE WRITE IN

FOR A QUOTE TO

TURN YOUR OLD

OR UNWANTED

GOODS INTO CASH

ONCE AGAIN

ORDER FORM

OVERSEAS SUBSCRIPTIONS

Magazine only:

☐ Europe £35.00 ☐ Rest of World £45.00

With disc: 5.25in 3.5in

☐ Europe £44.00 ☐ Europe £49.00

☐ Rest of World £64.00 ☐ Rest of World £69.00

BACK ISSUES

Please fill in the date (back to March 90)

Month _____ Year 90 ☐ 91 ☐

Magazine £1.95 ☐ Disc £4.95 (5.25in) ☐ £5.95 (3.5in) ☐

For overseas orders, please add £1 (Europe) and £3 (rest of World) to cover mailing costs

Please tick all the relevant boxes and return this entire page to **BAU Mail Order, PO Box 66, Wetherby LS23 7HL**

☐ I enclose a cheque/PO to Redwood Publishing Ltd

☐ I wish to pay by Access/Visa

Card number _____

Expiry Date _____

Signature _____

Name _____

Address _____

SMALL ADS

420/1 Learning Curve, RGB col Monitor, Epson LX80 printer, 12 issues Acorn User, all software - £1290. Tel: F Richardson, (0732) 359710

Electron 64K, +1, +3, +2 Rom, View, Viewsheets, Tape recorder, leads and manuals, some games - £180. MX80 FTIII printer & lead 75. Ralph Sillet. 22 Cherrybrook Drive, Penkridge, Staffs, ST19 5EA

BBC Master Compact and single 40/80 disc drive with manuals - £250 ono. Tel: S Dufford, (0455) 291015

BBC B, colour monitor, recorder, twin drives, Watford Rom/Ram board, Replay, Teletext, manuals, books, games. Excellent condition, boxed - £450. Tel: I Twisleton, (0604) 845257

A3000, 2Mb Ram, Acorn colour monitor + stand, manuals + applications discs, all good condition - £600 ono. Tel: Alasdair, (0785) 760082

Cambridge Z88, 128K additional Ram, mains adaptor lead and software for Arc connection - £125 ono. 1st Word Plus V2 - £20. Tel: David, 081-886 4040

Pace Linnet V21/23 modem + Hearsay - £100. Acorn DTP - £40. 1st Word Plus - £25. Genisis - £25. PC Emulator 1.34 + DR Dos - £25. Break 147 & Saloon Cars - £12 each. Tel: Peter, (07683) 52269

BBC B with cassette recorder, light pen, games and books - £100 Tel: John: 061-494 1676 eves.

BBC B, ADFS, 5.25/3.5in drives, genlock board, titling software, View family, Pendown, Eprom eraser, Ziff, Printer & auto sheet feeder - £350. Tel: E Foster, (0223) 63545

A3000, 2Mb Ram, colour monitor & stand - £710 ono. Genisis - £35, Atelier - £40, Logistix - £40, Art Nouveau - £20, 3.5in drive - £45. Tel: J Chuter, (0458) 250130

A3000 with Acorn colour monitor, PC Emulator, First Word, games, 2Mb. As new - £680. Tel: David, 0332 673784

BBC B with D/D disc drive, View W/P, Viewsheets, Viewstore, Viewspell, cassette player, joysticks, many games - £250. Centronics printer - £50. Tel: G Wise, (0734) 341866

BBC Master Compact, monitor, 3.5in disc drive, Wordwise+, games - £300 ono. Tel: (0703) 556105

BBC B, upgraded, sideways Rom, 40/80 Viglen drive, mouse, joysticks, Wordwise, Disc Doctor, books, data recorder, 50 plus games - £225. A Roulson, Savile Coach House, Savile Road, Halifax, W Yorks. HX1 2BA

Electron, immaculate condition, many games, tape recorder, first byte joystick interface - £150 ono. A Stevenson, 9 Kilmrey Gdns, Newcastle Road, Kilkeel, Co. Down, N Ireland. BT34 4AL

53Mb Rodime hard drive full of public domain software - £260. T/V camera, ideal for digitising - £100. Tel: Sean, (0872) 571281

GO

PROGRAMMING

WITH THE FLOW

MARK SIDEY presents a watertight case for simulating liquids on the Archimedes

Liquid is a program that can create a truly watery landscape – a red or blue liquid is cascading down your screen and you can play around with the concept by creating fountains, dams and all manner of water traps.

The shapes, ranging from slopes to bowls, are drawn using the mouse and can be altered in mid-flow. For instance, you can change the tide by drawing a bowl, filling it with liquid and then making a hole in the bottom to let it all run out.

Having chosen the type of simulation from the menu, set up the screen. Use Select for thick lines and Menu for thin ones. To erase, or make holes in shapes, press Adjust-Select or Adjust-Menu. To draw sorting pixels (see later), press TAB together with Select or Menu. Pressing 1 locks the y axis of the mouse, and 2 the x axis, which helps to draw straight lines. You can also start with a filled screen into which you erase tunnels, by pressing F. However, this won't work when the liquid is flowing.

If you choose two liquids flowing in opposite directions, all mouse drawing is mirrored. This is switched on and off by F2 and F1 respectively. Finally, to start the flow, press ALT. Press ALT again to return to the main menu.

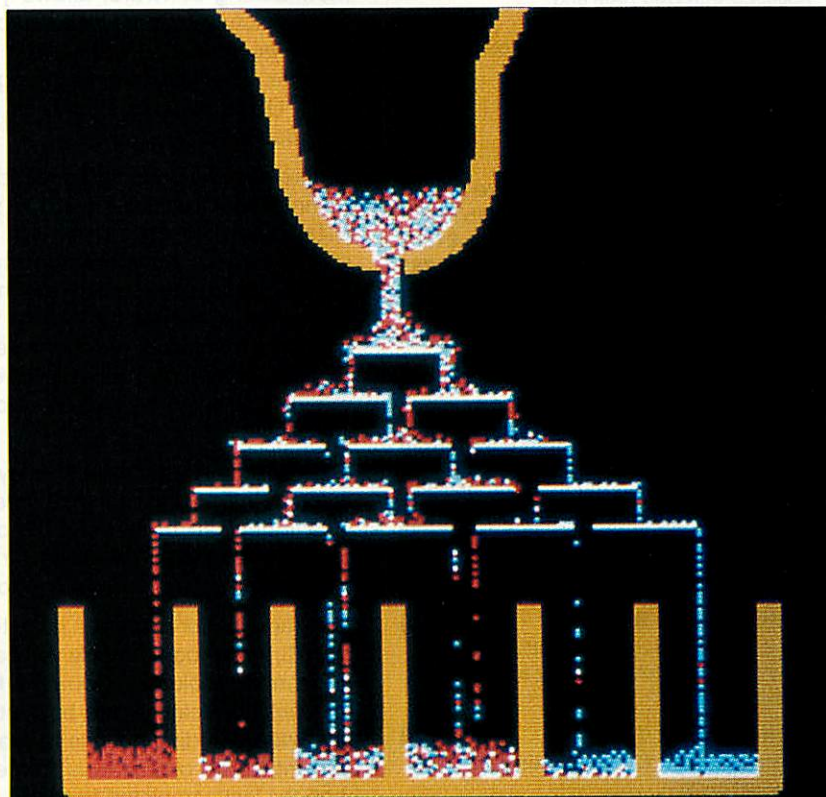
THE PROGRAM

The simulated liquid consists of a number of drops. For a drop to move, the following rules are applied. If the pixel below it is empty (black) it moves down. If not, left and right of the drop are checked. If only one direction is clear it moves that way, but if both ways are clear the drop will move 'randomly' in either direction. Finally, if all three ways are blocked, but there is an empty space above, the drop will move up. This last rule is very important – without it, the liquid can't flow around U-tubes, or in fact over any vertical barrier.

To obtain the fastest possible speed, all checking and plotting of drops is performed by directly accessing the screen memory. Each drop's position (or screen address) is stored in a table. Another table contains status bytes for each drop – there are three flags in each byte.

The first flag is set if the drop has not yet started flowing. (A drop can only start if there is space for it at the top of the screen.) The second flag shows the drop colour (zero or one) and the final flag is set if the drop is upward flowing. The flags are all set, depending on the choice made at the start of the program in `set_flags`. Note the `Not_Started` flag must always be set at the start.

The number of drops and the colours can be changed by altering the appropriate variables in the `set_variables` procedure. With certain numbers



TWO MIXED LIQUIDS FLOWING DOWN TO GIVE A WATERFALL EFFECT

YELLOW PAGES

To use this program turn to the listings entitled Liquid in the yellow pages and type them in. Instructions on how to copy the listing in and run the program are given on page 81. This program is also supplied free to subscribers on the monthly disc.

of drops you may encounter a kind of beat effect on-screen due to random numbers being obtained using the centisecond clock. If the time taken for the computer to cycle through all of the drops once is almost exactly a multiple of one centisecond, it loses the randomness. Counter the effect by using a few more or less drops.

THINGS TO TRY

Try drawing with sorting pixels. If a drop lands on one, and it is clear to the left and right, instead of random chance, the colour of the drop determines its subsequent movement – red drops flow left and blue drops flow right. Liquid will spontaneously flow up a tube one pixel wide so you can design syphons and capillary tubes, or even cheat gravity and pipe the liquid from a basin at the bottom of the screen up to the top.

As it is, the simulation is basic. Try adding factors, such as cohesion to form larger drops, or take pressure and velocity into account so that the liquid accelerates as it falls, and splashes when it hits a surface. Or flow with the tide and add a pump or water wheel.

TELEPHONE:
081-205 9558
FACSIMILE:
081-205 0190

TECHNOMATIC

TECHNO HOUSE,
468 CHURCH LANE,
LONDON
NW9 8UF

Archimedes Computers

Carriage £8/computer £12/system

A3000

A3000 with 2Mb RAM (no monitor)	£599
A3000 with 2Mb RAM Acorn monitor	£798
A3000 with 2Mb RAM CUB 3000 monitor	£788
A300LC with 1Mb with Acorn monitor	£649

Learning Curve Packages

A3000LC with 2Mb RAM (no monitor)	£639
A3000LC with 2Mb RAM and Cub 3000 monitor	£830
A3000LC with 2Mb + Acorn monitor Acorn 300 dpi inkjet printer	£1089
A420/1 LC with 4Mb and Cub 3000	£1259
A420/1 LC with 4Mb and Taxan 7700 + LR	£1419

NEW A5000 Learning Curve

2Mb RAM, expandable to 4Mb + 40Mb HD with Acorn multiscan monitor	£1531
A5000 LC with 300 dpi inkjet printer	£1765

A540

ARM3 + 100Mb SCSI HD, fitted with 8Mb RAM (upgradable to 16Mb)	
A540 plus Taxan 795	£2855

0% Finance on Learning Curves

Subject to Status. Ring for personal quotation

techno Tablet

Now 3 models to choose from:

technoTablet 9	£109(b)
6" x 9" tablet with captive 3 button stylus, perfect for sketching and for special needs applications.	

technoTablet 12	£179(a)
The original 12" x 12" technoTablet with 4 button puck.	

Optional Stylus for technoTablet 12 £15(c)

technoTablet 18	£329(a)
A new 18" x 12" tablet which will allow tracing of drawings up to A3. 3 button stylus as standard.	

technoSCSI Packages

300/400

Single width card for internal or external
drives.

Internal are complete with all fittings, external
feature compact, professional cases and
screened cables.

47 Mb internal + card	£249(a)
105 Mb internal + card	£389(a)
Optional External terminator	£12(d)
47 Mb External + card	£339(a)
105 Mb External + card	£469(a)

A3000

8 bit internal card with User Port. External
drives are housed in compact, professional
cases with screened cables.

47 Mb External + card	£339(a)
105 Mb External + card	£469(a)
Optional External terminator	£12(d)

techno-I

The techno-I Real-Time Colour Video
Digitiser for Archimedes computers is
one of the most advanced video
digitisers available, with features usually
found only on top-of-the-range models
for the IBM PC.

The techno-I card, with RISC OS
multitasking software, allows you to
grab a picture from a video source (TV,
Video recorder, etc.) and convert it into
a sprite. This can then be dragged to
RISC OS applications such as art or
DTP packages.

Unlike simple RGB video digitisers,
techno-I handles colour in 25 bits with 7
bits luminance and 18 bits
chrominance. By manipulating the
image using hue, saturation and
luminance, it mimics the human visual
system. The colours are therefore truly
WYSIWYG. techno-I will also give true
monochrome representation of colour
images.

The on-screen viewfinder displays live
colour or monochrome in real-time. The
viewfinder can be either 1/16 or 1/4
screen area, and can be offset vertically
and horizontally under user control.

The frame buffer resolution is up to 512
by 512, with programmable vertical and
horizontal resolution. Complex frame
manipulation features are built into the
hardware including options to grab the
current frame or previous frame and
grab the last completed frame.

All viewing, video and digitising
parameters are software controlled,
there are no presets, no setting up,
simply connect to a video signal, load
the software and digitise!

techno-I features include:

- ★ 25 bits resolution, 7 bits luminance
and 18 bits chrominance
 - ★ Contrast, colour and brightness set
from Desktop
 - ★ Image scaling up to 1280 by 1024
 - ★ Selectable or automatic
monochrome/colour digitising
 - ★ Auto detection of video signal, field
frequency and colour
 - ★ Single width podule using surface
mount technology
 - ★ Zero wait state 16 bit MEMC podule
 - ★ Low chip count (13 chips) utilising
the latest technology
 - ★ 40% of chips Brainsware
designed
 - ★ Uses a single 5v supply only
 - ★ Compatible with international TV
standards
 - ★ Chrominance comb filter for studio
quality CVBS colour
 - ★ CTI sharpens edges of coloured
objects
 - ★ Picture signal improver enhances
the luminance content
 - ★ Automatic black level and gain
control
 - ★ Hardware programmable noise
filtering
 - ★ SVHS input upgrade available
"a big improvement on the best
available from previous digitisers"
- Trevor Attewell, Archimedes World**
"...surprisingly good value compared to
the rest of the field" **Rob Millar, Acorn
User**
"using techno-i is a doddle ... an
excellent and easy to use product"
Steve Bruntlett, The Micro User

techno-I for 300/400, 540, etc	£249(b)
techno-I for A3000	£279(b)
(Securely boxed for external fitting)	
SVHS Upgrade	£100(d)

NO PRINTED PICTURE CAN DO IT JUSTICE - Send for FREE Demo Disc

Archimedes Expansion

Acorn I/O card	£80(b)	Wild Vision Chroma Genlock CG2	£215(b)
16 bit Parallel I/O card	£195(b)	ADC 1208 A to D Converter	£495(b)
MIDI Add-on to Acorn I/O	£37(c)	Dual RS232 Serial Card	£195(b)
MIDI Expansion Card	£66(c)	IEEE Interface	£283(b)
		ARC Prototyping board	£35(c)

Archimedes Tracker Ball	£30(c)
-------------------------	--------

A3000 Expansion

Acorn MIDI/User Port	£49(b)	Master 128	£379(a)
Wild Vision Chroma Genlock		Microvitec 1431 14" Std. Res. Colour	£169(a)
CGI	£215(b)	Philips CM8833/II 14" Med. Res. Colour	£209(a)
Serial Port Upgrade	£19(c)	ROM Cartridge	£13(d)
A3000 Monitor Stand	£17(b)	32K RAM Cartridge and utilities	£12(d)
		PS400 5.25" 40/80 drive with PSU	£90(b)

Master Series Systems

Tel: 081-205 9558 Fax: 081-205 0190

technoSCAN II

Probably the definitive monochrome scanning package!

The all NEW technoSCAN II package provides full monochrome operation at 400 dpi as well as 8 and 16 level grey scale scanning and provides the following features:

Suitable for all Archimedes micros and integrates fully with the multitasking RISC OS environment.

Advanced memory management system releases memory when not required allowing scanning and DTP in a 1MB computer.

Flexible zoom control allows palettes to be imported, tailored and resaved with more powerful tone and tinting features than most painting packages.

Interactive help and a superb manual.

Direct printing with RISC OS drivers.

Saves sprites direct into PAINT and DTP or to disc.

Saves sections and palettes into any graphics mode.

At the same low price as the well tested original.

technoSCAN II complete with

interface card and manual

£149(b)

technoSCAN II for A3000

£175(b)

technoSCAN II upgrade

for techno SCAN

£22.50(c)

Archimedes Monitors

Acorn 14" Medium Resolution,

Colour with Stereo Sound

£209(a)

Philips CM8833/II Med. Res. Colour.

Stereo Sound, 1 year's on-site maintenance

£209(a)

Taxan 770+LR Multisync High Res. Low

Radiation Colour

£365(a)

Taxan 795 Flatscreen Multisync. Hi. Res.

Colour with VIDC Enhancer

£399(a)

Archimedes Printers

Dot Matrix

Epson LX400 9 pin 150 cps

£110(a)

Epson LQ200 24 pin 150 cps

£179(a)

Star LC200 Colour 9 pin

£159(a)

Star LC24-200 Colour 24 pin

£225(a)

Inkjet

HP Deskjet 500 B/W 80 column

300dpi

£295(a)

Canon BJ10ex 80 column portable

360dpi

£199(a)

Canon BJ300 80 column 360dpi

£349(a)

Canon BJ330 132 column 360dpi

£395(a)

Colour Inkjets

HP Deskjet 500C Colour 80 column

300dpi

£499(a)

HP Paintjet Colour 80 column 180dpi

£439(a)

HP Paintjet XL Colour

132 column 180dpi

£1059(a)

Integrex 132 80 column

£499(a)

Laser Printers

HP Laserjet IIIP 1Mb RAM

£699(a)

1Mb RAM Upgrade for IIIP

£56(b)

Canon LBP4 0.5Mb for LaserDirect

HiRes

£585(a)

LaserDirect HiRes4

£350(b)

1 year on-site maintenance on laser printers

What we can offer in addition to efficient sales, service and professional backup!

We not only offer professional advice when you are purchasing your system but we will also provide friendly assistance afterwards. All our products carry a 12 month full warranty for parts and labour.

techno-ION Bundle

★ techno-I Real Time Colour Digitiser ★ Canon ION CCD Camera

★ SVHS Upgrade to techno-I

★ SVHS and RF cables

Capture 3-D objects in full colour on the Canon ION camera. With rechargeable batteries you can take up to 50 pictures, storing them on its floppy disc. They can then be digitised using techno-I to provide the best images available on Archimedes computers.

techno-ION for 300/400/540/5000

£699(a)

techno-ION for A3000

£729(b)

Send for our free catalogue and price list

★ SPECIAL OFFERS ★

★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★ ★

A305/310

Acorn Hard Disc Controller **£79(b)**

techno Hard Disc Controller **£79(b)**

Brainsoftware 4 slot

backplane **£25(b)**

Cooling Fan for A310 **£13(c)**

400/1 Series

2nd Floppy Disc Drive **£75(b)**

Replacement PSU **£75(b)**

300/400 Series

technoSCSI card **£99(b)**

ROM MODULE **£10(c)**

AKA20 Floating Point Unit **£350(b)**

AEDA External Floppy adapter **£10(d)**

A3000

3Mb RAM Upgrade **£119(c)**

AEDA External floppy adapter **£10(d)**

Technical Reference Manual **£25(c)**

Techno SCSI card

(with User Port) **£79(b)**

RAM Upgrades

A310 1Mb **£99(b)**

A310 3Mb **£199(b)**

A3000 1Mb **£49(c)**

A3000 3Mb **£119(c)**

A400/1 per Mb **£45(c)**

A440/1 4Mb **£599(*)**

A540 4Mb **£275(c)**

A5000 2Mb **£110(*)**

ARM 3 Fitted by us **£375(*)**

This is only a selection of our range,
please send for our free Acorn catalogue

Name

Address

Return to:

**Technomatic Ltd, Techno House
468 Church Lane, London NW9 8UF**

Send for
our new
comprehensive
**ACORN
CATALOGUE**

TECHNOMATIC

All prices ex VAT. Prices and specification are subject to change without notice. Please add carriage (a) £8.00 (Courier, 2 days) (b) £5.00 (c) £2.50 (d) £2 Next day delivery at extra charge

HARD 'N' EASY

Keeping your hard disc in shape is easier than you think.

PAUL JAMES shows you how

All us people with hard discs face a similar problem – that of organisation. Admittedly, having the capacity to store thousands of files in one place is great, but don't forget that it has to be kept neat and tidy, just like your desk at work or school.

However, certain aspects of this necessary organisation will require you to understand the set-up of the *!Boot* files, *!Run* files and other gadgets that generally hide some of the complexities of Risc OS. Keep reading and you'll discover, among other things, how to modify your *System* directory, add as many fonts as you like and design your own icons to personalise your desktop.

SYSTEMATIC

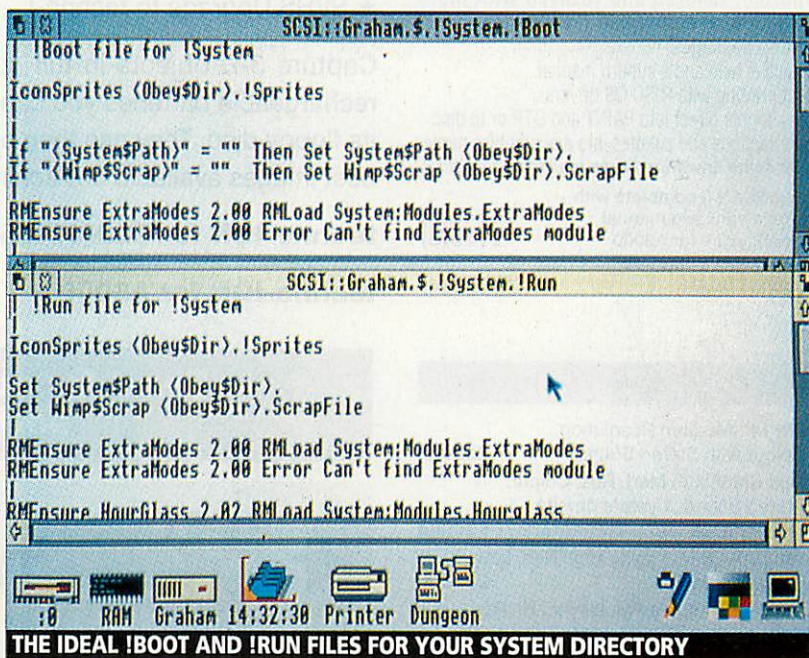
The *System* directory is an important part of Risc OS as it contains the shared resources, modules that can be used by more than one application, in much the same way that your spice rack at home stores frequently used spices. For instance the CLib module has routines that are used by *Draw*, *Paint*, *Edit* and many others. Having shared resources cuts down on application size and helps to standardise many common things about the desktop.

System is a directory, as are all applications such as *Draw* and *Paint*. An application directory however, differs in a couple of ways from a normal directory. Most importantly, its name begins with a pling (!). To open an application directory you will need to hold down SHIFT and double-click on Select.

When Risc OS recognises an application directory the *!Boot* file inside it (if it exists) will be executed. *System* is one of two applications that must go into the root directory of your hard disc, that is, the directory which is first displayed when you click on the hard drive icon. This ensures that the *!Boot* file inside the *System* directory is the first to be executed. In the case of the *System* directory the *!Boot* file sets up a few pointers that other applications can use to locate *System* and its resources.

Take a look at the example *System !Boot* file on this page, noticing the comments in the first few lines for clarity. A vertical bar symbol tells the obey file reader to ignore the rest of the line. It's a good idea to add comments such as these to your files, and you should make extensive use of them in your own script files.

The command *IconSprites* then ensures that the *!Sprites* file inside the application directory is added to the Wimp sprite pool. This usually includes a sprite with the same name as the directory, which is used in the directory viewer



NAMES & ADDRESSES

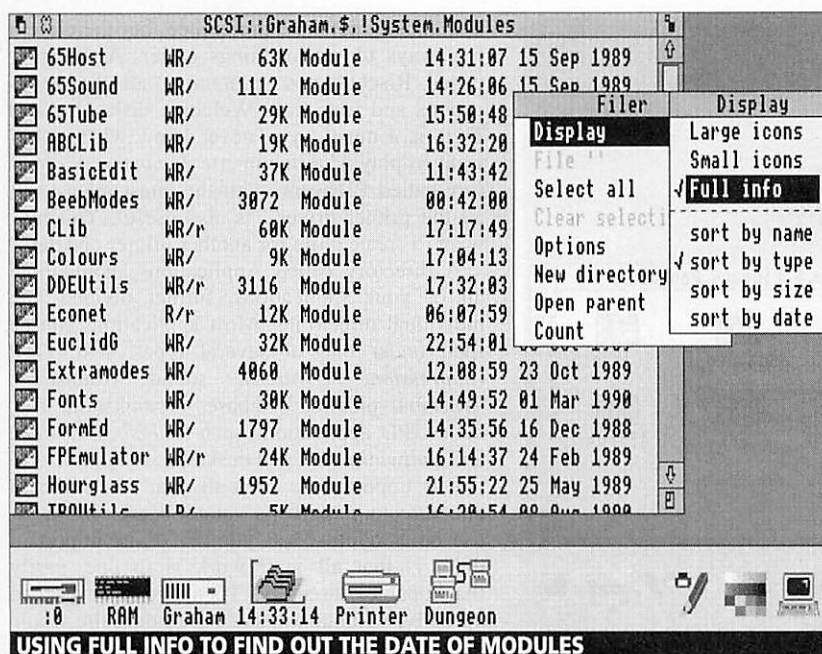
If you take a look at the title bar of a directory viewer you will notice that there is a textual representation of that directory. Beginning with the filing system (ADFS, SCSI and so on), it is followed by a list of directories separated by dots. This is the internal format of a filename and is not only the file's actual name, but also its exact location – its address if you like.

as an icon. Drag the *System !Sprites* file on to *Paint* to see this – it may give you a hint as to how to personalise your desktop.

Obey\$Dir is a system variable which contains the position of the last (or current) obey file to be seen by Risc OS. Setting the *System\$Path* variable to equal the *Obey\$Dir* variable means that there will be a permanent record of where *System* can be found; *Obey\$Dir* changes as you move through the directory viewers. The command *if* will ensure that it is only set if it was not set before. However, notice that in the *!Run* file of the *System* directory the *if* statement is omitted. Double-clicking on an application directory executes the *!Run* file, as opposed to Risc OS executing the *!Boot* file automatically. This means that double-clicking on *System* unconditionally sets the current *System* path. You must do this after you've shown your computer any other floppy discs that contain a *System* directory.

When an application needs a module from the modules directory within the *System* directory, such as CLib, the command *RMLoad System:Modules.Clib* will load it into memory. This is usually done in the application's own *!Boot* or *!Run* file.

This technique is used in my example *!Boot* file to automatically load the module *ExtraModes*. *RMEnsure* is the same as *RMLoad*, but will not load the module if it is already in memory. It also has the ability to test the version number of



USING FULL INFO TO FIND OUT THE DATE OF MODULES

a module. On the machines in the BBC Acorn User office the *!Boot* file also loads special Econet modules and Arm3 support modules.

ALL CHANGE

Every so often you may purchase an application that will need an updated version of a module. If when installed your application can't find the updated module in your hard disc's *System* directory you will get an error. New modules required by applications will be supplied on a floppy disc, inside a similar *System* directory, and you will have to copy it over to your hard disc's *System* directory.

There are two ways to replace a module. *Sysmerge* is a little application usually supplied with a new module. It will correctly merge two *System* directories by comparing version numbers of the modules that may need updating. If the version number of the module on the new disc is higher than the one in your current *System* directory, then the latter will be replaced.

However, you can just as easily carry out this procedure yourself. Open your *System* directory and then open the Modules directory. Press Menu over the directory viewer, move into the Display submenu and click on Full info. This will tell you the exact time and date when the modules in your *System* directory were created. Compare these with the supplied *System* directory on the new application disc. If a module on the floppy disc has a later date than that of the one in your *System* directory then drag the newer version across. However, before you do this ensure that you rename the old module, to something like OldCLib for instance. This is probably being too careful, but an application that runs quite happily using the older version of the module may complain in subtle ways about the new one. Having the old version of the module on your hard disc at least gives you the chance to rectify any faults resulting from the update by temporarily renaming the old module.

If you do decide to use the *Sysmerge* application then ensure that its version number is 1.02. In the case of applications, you can obtain

EDITING OBEY FILES

Edit has the ability to edit not only text files, but any file. It can also create Obey file command scripts. Press Menu over the Edit icon on the icon bar and move into the Create submenu. If you click on New Obey file what looks like a normal Edit window will pop up. However, when you save this file, its filetype will be that of an Obey file. Similarly Obey files can be dragged on to Edit for editing.

this information from the Info menu on the icon bar. Earlier versions of *Sysmerge* had a small bug that reversed its effect, thereby actively ensuring that your *System* directory was as out of date as possible!

And don't forget to double-click on your hard disc's *System* directory to ensure that the system variable, *SystemSPath*, is pointing back to that directory, and not the one on the floppy disc.

Another thing you can do in *System !Boot* files is to automatically run the *!Boot* files of commonly used applications. You must be familiar with the little blank boxes that show that the application that owns the file hasn't yet been seen. More accurately, the *!Boot* file of that application hasn't been executed, so the sprite for that icon isn't yet defined.

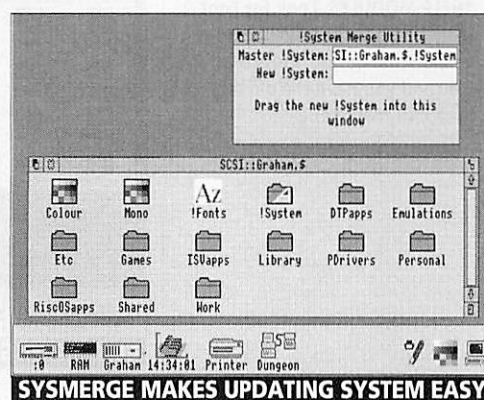
For instance, if you frequently use *Draw*, then inserting a line at the end of the *System !Boot* file to execute the *!Boot* file of *Draw* will not only define the draw file sprite, but will also remove the need to see *Draw* before you load a draw file. To do this, simply include the address of the *!Boot* file in your *System !Boot* file, under a little heading that says: Now running the *!Boot* files of popular applications.

FONTING AROUND

Your *Fonts* directory is another application directory that should be in the root directory of your hard disc. Many Risc OS applications use fonts and there should always be a system variable set up pointing to this directory.

Your root *Fonts* directory should only contain a few fonts – mainly Trinity, Corpus, Homerton and Dingbats (or Selwyn).

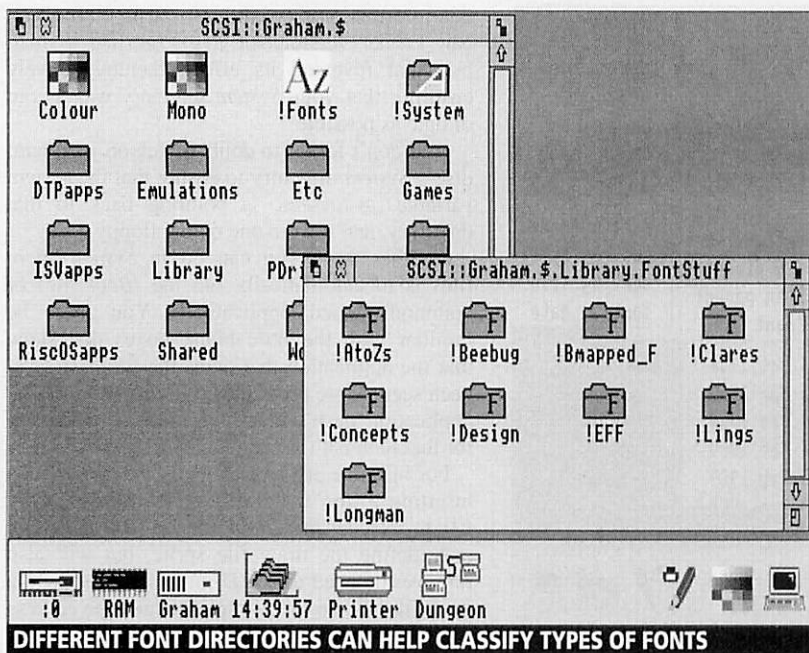
It is possible to have several outline font directories, and only add to the list of available fonts when you double-click on one. This



SYSMERGE MAKES UPDATING SYSTEM EASY

method can be used to segregate fonts into fancy and plain typefaces, or into alphabetical groups for example. It will also alleviate the problems that are often caused when you have too many fonts present. For instance, *Edit* crashes if there are more than about twenty, and *Draw* will complain subtly if there are more than about thirty typefaces.

It is easy to add another fonts directory to your hard disc. Create a new directory, perhaps calling it *!MoreFonts*, and then copy the contents of the core *Fonts* directory (*!Boot*, *!Run* and *!Sprites*) into it. You will need to load the *!Sprites* file into *Paint* and rename the two icon sprites to *!morefonts* and *sm!morefonts* respectively. Then move your selected fonts into this



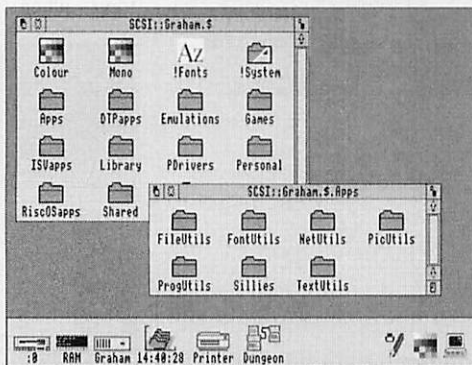
DIFFERENT FONT DIRECTORIES CAN HELP CLASSIFY TYPES OF FONTS

OUTLINE FONTS

If you don't have outline fonts then you should obtain them. But be careful, you may already have an outline font manager. It appears in places such as Impression, Ovation or the Acorn PC Emulator, or you can purchase it with a few fonts direct from your local dealer. Check that your font manager is the outline version by pressing F12 and typing *HELP MODULES. Look for Font Manager; next to it will be a version number. Any less than 2.00 and you have the old bit-map font manager.

new !MoreFonts directory. Clicking on the new directory will swap to the set of fonts contained within it.

Do be aware that if you use this system, when you double-click on the new directory your Arc will forget about any previous set of fonts. This is because a system variable called FontSPrefix is set to point to the folder holding the new set. You can modify the line in the !Run file within the second font folder so that it reads Set FontSPrefix <ObeySDir>.<FontSPrefix>. Then the variable will point at the new fonts, held in <ObeySDir>, and also at the old set. However,



CLASSIFYING APPLICATIONS

don't change the !Run file of the core folder because you may want to return to your core set to run Edit.

Now you can create as many font directories as you like. Double-clicking on each will add the extra fonts to the available list, while double-clicking on the core folder will strip the list back down to its minimum again.

WHAT GOES WHERE?

The main problem when storing lots of files and applications on one disc is how to classify them. Putting all of the applications in one big directory is no good. Not only would it be confusing, but it would also take ages to open as Risc OS has to load each !Sprites file in each application and obey each !Boot file. Therefore applications have to be put into smaller directories.

It is mostly personal preference, but there are a few ways to make things easier. A directory called RiscOSApps, containing all the applications and files from Welcome discs One and Two, is a must – you never know when you'll want to play *Maestro* or use *Madness*. A directory called PDrivers, with the latest releases of all the printer drivers, is also useful. You may want to create a file for another printer one day.

A directory called Applications should hold all of your applications, further divided into individual directories. Most applications can be filed under one of several types: text, DTP (*Impression*, *Ovation*), sound (*Rhapsody*, *Tracker*), picture, database, organisation, file, sillies (PD applications such as *Fish*, *Deskduck* and *Bullwink*), font and desktop.

It is important to keep all your work files in one directory, perhaps called Work (inside, it can be as confused as you like). The important thing is that all your work is in one, easily 'backupable' directory. Then it can be backed up daily, without wasting time doing the whole hard disc. If you have access to a network, your network manager can set aside an area to dump your work directory in, to back up every night.

A library is also important, for dumping things like simple utilities, hard disc formatters, any little programs you write to help you, clip art, or even text files consisting of general notes.

SAVING SPACE

Unless you have a massive hard drive, space will always be a problem; after all you only add files, there's no point in deleting them. The most significant space savings can be made by storing old files in a compressed form. I find that the biggest collection of files on my hard disc is old games that I rarely play. Finished work also falls under this category, and I usually keep an archive file in each directory called *OldStuff*.

Also look out for large sprite files, or files that contain large sprite files, perhaps drawfiles. These can easily eat up to 1Mb a time.

Many applications include a file called !Help, describing what it does. To access this, press Menu over the application in the directory viewer, move over App. <appname>, and select Help. However, in some cases it will go on for pages. I recently found a help file of 40K in size and promptly sent it up to help file heaven!

DIY DESKTOP

All the icons in the desktop are sprites, for instance the name of the sprite for the floppy disc is floppy disc. You can redesign the icon for the floppy disc by simply creating another sprite with the same name and dimensions and adding it to the !Sprites file in your System directory.

The following is a short program to grab all of the desktop sprites and save them as Wimp sprites. Then you can selectively save individual sprites into your System !Sprites file and redesign them. Don't save all of them into the file as this will waste disc space, and memory.

Press F12, type BASIC, and then type these lines:
SYS "Wimp_BaseOfSprites" TO base%
SYS "XOS_SpriteOp",256+12,base%,"WimpSprs"
Type *QUIT and the Wimp sprites will now be in a file called WimpSprs.



BBC A3000 ARM3's

£ 199.00 + VAT

£ 233.83 inc VAT

Fitting (inc courier collection and return) £ 41.13 inc VAT

Archimedes ARM 3's

£ 199.00 + VAT

£ 233.83 inc VAT

For 300/400 series User fittable



ARCHIMEDES 540 RAM UPGRADES

4 Mb Board £ 345.00 inc VAT

ACORN A5000

2-4 MB Ram Upgrades

Hard Disc Upgrades 105 Mb +

PLEASE PHONE FOR DETAILS

Ram Upgrades available Nov 91



A3000 RAM UPGRADES

2nd Mb £ 69.00 inc VAT

4th Mb £ 200.00 inc VAT

Our 4Mb expansion board uses 8 x 4Mbit chips which will not overload your power supply.

310 RAM UPGRADES

Upgrade to 2 Mb £ 200.00 inc VAT

Upgrade to 4 Mb £ 300.00 inc VAT

Upgrade 2 to 4 Mb £ 140.00 inc VAT

Includes fitting of the upgrade, courier collection and return of your computer.

THE FIRST & STILL THE BEST

CEmicro's

78 Brighton Road, Worthing,
West Sussex. BN11 2EN.

Telephone 0903 213361



DEALER ENQUIRIES WELCOMED

Please Send me further details on the following products.

Arm 3's ☐ Memory Upgrades ☐ General ☐

Name Tel

Address

.....

.....

Post Code Computer.....

For academics, college or school students presenting experimental results or project data, or for businessmen wanting to show just how much better (or worse) the next year is going to be, there's no denying the attraction and utility of a simple graph. Just as spreadsheets can do the repetitive adding up, graphing and charting applications can be used to turn raw numbers into neat, simple charts.

On the Archimedes, these applications come in two forms; there are the spreadsheets with some graphic capability (Clare's *Schema*, Colton Software's *Pipedream 4* and the forthcoming *Eureka* from Longman Logotron) which allow you to mark out a block of numbers and get an 'instant graph'; and dedicated packages, which take numbers from elsewhere and turn them into graphs – usually the data is imported as a CSV (comma separated value) file, which is a text file containing a list of numbers with commas between. All of these applications offer a range of graph types (bar graphs, pie charts and so on), and you can take a graph and export it as a drawing into DTP package, direct to the printer or into *Draw* for alteration.

CHARTWELL

Risc Development's *Chartwell* is the latest of the dedicated charting applications to make an appearance, following the well-established *Presenter* and *Graphbox* from Linguinity and Minerva – both have been upgraded recently.

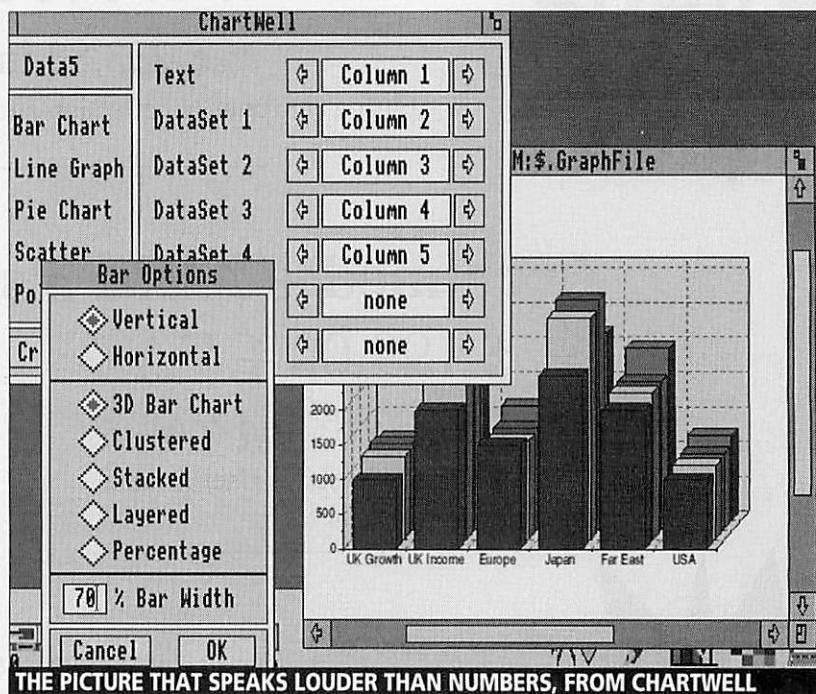
Chartwell is deceptively simple at first, but as with the others, you can set up some complex graph types – for example, polar plots or scattergrams with a superimposed line of best fit. Unlike early versions of *Graphbox*, it installs on the icon bar, and you can drag CSV files onto it from a spreadsheet or disc. A dialogue opens which contains radio buttons to choose what graph type you want – bar graphs, line or pie charts, scattergrams or polar plots.

The menu gives access to a number of options for each graph type – so for a pie chart you can specify whether to explode one sector (the biggest, the smallest or any particular one), and whether to display some text, or the absolute or relative value of each segment as a number in a box just outside the pie. It is remarkably simple.

The options are broken down into a series of relatively small dialogues for each graph type, rather than one giant dialogue controlling all aspects of the graph drawing process. Bar graphs and pies can be flat or 3D-effect – the defaults are for 3D, probably because they make the application more impressive the first time you use it.

The main menu also allows you to change some overall options, such as: the colour to be used for each bar or pie sector; the labels for each of the columns of data (these can also come from the CSV files); the shape and colour of blobs to be used in line graphs; and whether to use a background grid or shading to 'enhance' the graph. You can add a title to the chart too.

All the options chosen can be saved in a 'style sheet' file, which makes it remarkably easy to create the same type of graph again – just drag in the style sheet as well as the CSV file. Once set up, the Create button in the main dialogue produces a standard Save as box with a draw file



CHARTED COURSE

GRAHAM BELL
looks at two
packages designed
to bring your
office or school
data to life

icon, which you can drag to *Draw*, to disc, to the printer or any other application.

There's no way of editing data once it's in *Chartwell*. If you spot a wayward line on the graph, you need to go back to your spreadsheet or CSV file and edit it. And just as you can't see the raw numbers, *Chartwell* relies on *Draw* to display or print the graph. You can alter fine details in *Draw* as you would expect. None of the elements of the graph are grouped in *Draw*, which can make this a bit fiddly.

Most parts of the package are good and flexible. But for example, although it uses the SwissB font provided for labelling you can change the font in the Run file by altering the *Chartwell\$Font* variable, it seems a bit of an afterthought – it should have been alterable from the main menu. And when you've imported a CSV file, you can in effect change the order of the columns of data or miss one out – very useful indeed.

Also, in common with many other graphing packages, you can't transpose the data. You can't graph by row instead of by column, so you need to make sure your spreadsheet is designed the right way. And there's one quite fundamental flaw: *Chartwell* cannot accept negative values. An update is promised to cure this.

GRAPHBOX PROFESSIONAL

Minerva's *GraphBox Professional* is a large-scale reworking of the original *GraphBox*: it retains facilities like hotlinking to *Pipedream*, adds to the already huge selection of graph types (there are now 43), but also improves upon the presentation of the original and adds some sophisticated new abilities.

You can gauge a feel for the application from the documentation: a chunky slip-case, with a ring binder and an exhaustive manual. But in truth it does a relatively simple job. It takes an array of numbers and turns it into a drawing.

In a change from the original, *GraphBox Professional* installs on the icon bar, and opens a blank graph window only when you click on it. You can drag data files to the icon bar too. Like *Chartwell*, the best way to get data into *GraphBox Professional* is to import a file from a spreadsheet. CSV and TSV (tab separated value) files are accepted, along with SID (software independent data) file format.

These last are in two sections. Half contains the data in CSV form, the other half contains a range of commands that control a lot of the graphing options – in effect, like the *Chartwell* stylesheets. When you have one graph displayed, Ctrl-dragging in another SID file loads the new style commands without the new data. Again, this is good for producing lots of consistent illustrations. (You can produce SID files containing only the style sheet elements by pressing Ctrl while saving.)

Unlike *Chartwell*, *GraphBox Professional* actually shows you the graph – it doesn't just assemble a file for *Draw* to display – and it can print directly too. You can zoom in on the graph in a *Draw*-like way, and make measurements off screen – the precise mouse position can be shown at the top of the window. Of course, the graph can be exported as a drawing: the elements of the graph are neatly grouped which makes editing in *Draw* a bit simpler than with the output from *Chartwell*.

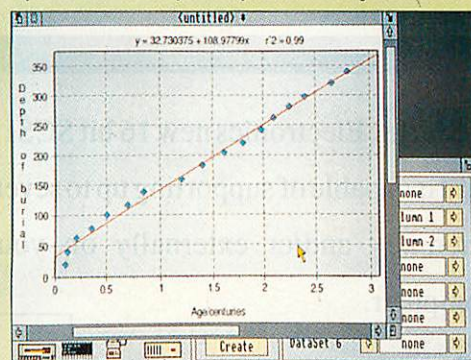
The main *GraphBox Pro.* menu allows you to choose the graph type from a huge list, or set up a host of options to change the look of the graphs. Another choice leads to a way of editing the data or of typing in your own from scratch, like a mini-spreadsheet which can't do calculations. You can insert and delete columns, and copy columns from one part of the table to another by dragging with the mouse. But again there's no way of transposing the table so columns become rows and vice versa.

The Options dialogue window is huge and although it makes extensive use of boxes and borders within the dialogue, it looks confusing and messy. It doesn't change, so there's often a lot of clutter around that simply doesn't apply to the graph type. And, worse, there are hidden menus which only appear if you click in a certain place, so it's difficult to know if you've found them all. Computer Concept's *Impression* DTP package uses hidden menus too but it changes the pointer to indicate their presence. *GraphBox Pro.* does not and in the already confusing dialogue box, the cues get lost.

The options are fairly complete, and allow the same sort of control over background shading, grid lines, axis limits and labels as is offered by

THE ACTION REPLAY

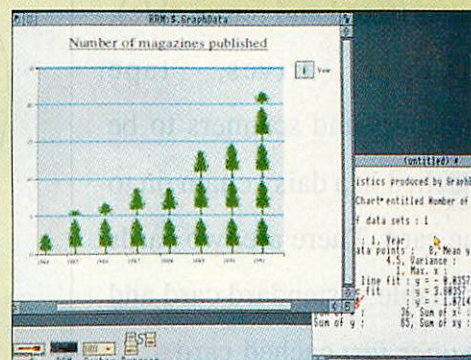
The line graph options are particularly good in *Chartwell*. As well as plain intervals along the x-axis of a graph, x-y pairs of data points can be used to create scattergrams. You can of course choose the colour and shape of the data points plotted. But you can also superimpose a line of best fit through the points and the graph shows the equation of the line and coefficient of determination (the square of the Pearson product-moment correlation coefficient) too. If you can express the expected errors in your data as a percentage of each value or as absolute values (for example +8per cent or +6) then you can also add natty error bars to the graph. These are impressive to look at, although such simple error functions are rare.



CHARTWELL: SIMPLE BUT EFFECTIVE

GraphBox Professional can create 'picture graphs', where the bars are made up of a logo stacked up to the correct height. Company reports are littered with them: a baker's profits shown by stacked ears of wheat; train journey miles presented as speeding carriages, etc.

GraphBox's facility is workable but a little rudimentary, with the size of each tile (one ear or one carriage) controlled by the subdivisions of the y-axis. The topmost tile is squashed to fit, rather than being truncated as is the normal treatment. Also the tiling doesn't work properly in multisync or VGA modes. Setting up is simple: choose the type of graph, drag in the data and a draw file containing the pattern. The effect, in the right circumstances can be very impressive.



GRAPHBOX PRO: FOR SPECIALISED USE

PRODUCT DETAILS

Product: Chartwell
Supplier: Risc Developments,
117 Hatfield Road, St Albans,
Herts AL1 4JS
Tel: (0727) 40303.
Price: £25.49

Product: GraphBox Professional
Supplier: Minerva Software,
Minerva Hse, Baring Crescent,
Exeter, Devon EX1
Tel: (0392) 437756
Price: £129

Prices exclude VAT

Chartwell's more comprehensible dialogues. One particularly thoughtful feature is that the graphs can easily be produced in shades of grey, or even in plain black and white, with a series of hatched patterns that look better on dot-matrix printers than grey shades.

Line fitting is also a bit more flexible in *GraphBox Professional*, with linear, quadratic and cubic line fitting using least squares regression. A range of statistics can be printed out or exported too, giving such values as the number of data points, the means, the standard deviation and sum of squares of x values and the area under a curve, as well as the coefficients of the best fit line. This can be exported as CSV to go back into a spreadsheet, or neatly formatted as plain text to go into a wordprocessor.

CONCLUSION

At well over £100, *GraphBox Professional* costs considerably more than its competition, and offers an extraordinary range of graph types. These include rainbow-shaded surface plots, vector diagrams and ternary diagrams, so it's worth checking carefully. Yet unless you need one of its more specialist graphs, this package offers very little extra.

Chartwell scores on simpler controls over the basic graph types. It also has enough effects to present material prettily, at a price that makes it attractive to the home or school user.

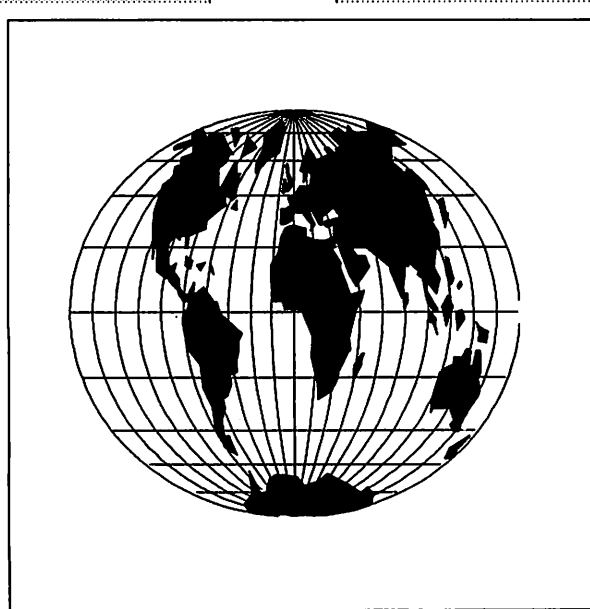
IN A PERFECT WORLD ALL INTERFACE CARDS WOULD BE MADE THIS WAY



... Morley Electronics new 16 bit SCSI interface card is capable of supporting up to seven devices internally and/or externally on your Acorn computer.

...The SCSI system allows devices such as hard disc drives (fixed and removable), CD-Rom drives, tape streamers and scanners to be attached in a daisy chain on to one card. There are two cards available, a standard card and a *super fast* cached card.

... Our card is the **fastest** available for Acorn machines with the cached version being able to offer data transfer rates of up to 3.9MB/s sustained and 6MB peak. We are offering the card as either a separate item or bundled with one of the devices listed on the right.



... All prices include mechanism, all necessary cases, cables, software and a standard interface card. Tape streamers and removable hard discs also include one tape and cartridge respectively.

A3000 Fixed Hard Discs
 20MB £289.00
 50MB £379.00
 100MB £499.00

A3000, A400 & A5000 Fixed Hard Discs
 20MB £219.00
 50MB £299.00
 100MB £449.00

Tape Streamers
 150MB £799.00

Removable Hard discs
 44MB £565.00
 90MB £725.00
 44MB cartridges £65.00
 90MB cartridges £109.00

Flat Bed Scanners
 Computer Concepts ScanLight Pro A4
 256 grey scale flatbed Scanner £999.00

Interface Card
 A3000 standard £169.00
 300/400/5000 standard £149.00

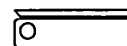
For Cached Interface please add £50.00

... Our staff are always ready to answer any queries you may have about any of Morley's products especially concerning compatability with your existing equipment.

**Please note that 300 series machines require a MEMC1A upgrade and backplane to be fitted, both available from Morley.*



:0 SCSI DRIVE :4 SCSI DRIVE :5 CD-ROM



TAPEDRIVE SCANNER

MORLEY
 E·L·E·C·T·R·O·N·I·C·S · L·T·D

Education & Dealer Enquiries Welcome
 Please note all prices exclude VAT and carriage
 Morley Electronics Ltd, Morley House, West Chirton,
 North Shields, Tyne & Wear, NE29 7TY
 Tel 091 257 6355 Fax 091 257 6373



Program	Page	BBC B B+	B+/ 128	Master 128	Master Compact	Electron	6502SP/ Turbo	ADFS	Econet	Shadow Ram	Archimedes/ A3000/A5000	Monthly disc
★Info	49											
Info 1		■	■	■	■	■	■	■	■	■	■	■
Info 2								■	■		■	■
Info 3								■	■		■	■
Info 4		■	■	■	■	■	■	■	■	■	■	■
Info 5								■	■		■	■
Info 6		■	■	■	■	■	■	■	■	■	■	■
Info 7								■	■		■	■
Info 8								■	■		■	■
Info 9		■	■	■	■	■	■	■	■	■	■	■
Info 10		■	■	■	■	■	■	■	■	■	■	■
Info 11								■	■		■	■
Info 12								■	■		■	■
Arc Assembly	58											
Armprog1 - 2								■	■		■	■
Printers	61											
ESC1 - 2		■	■	■	■	■	■	■	■	■	■	■
Liquid	71							■	■		■	■

Typing in listings from the yellow pages.

The yellow pages are subdivided into article headings. Each article heading corresponds with its article in the magazine.

So for instance to find listing five of ★INFO in the yellow pages (Fire32) look for the ★INFO heading, then follow the listings through until you get to listing five.

At the beginning of the program are a few lines that tell you what machines it works on. This information can also be derived from the table above.

For Archimedes owners it may not be immediately obvious how to actually type in the listings. By pressing Function key 12 you can access the command line. From here type BASIC and the Archimedes will enter the Basic language. You may like to type MODE 12, which will turn the screen to white on black.

Then simply copy each line of the program in turn after the '>' prompt, pressing RETURN when finished. Save the program onto disc by typing SAVE "<filename>". It can then be run by typing RUN. You will probably need to debug it as you may have made some typing errors.

When you have finished debugging save the program one last time. Then it can either be double-clicked upon from the desktop, or loaded using LOAD "<filename>".

A more detailed description of how to type in listings from the yellow pages appears in BBC Acorn User August 91.

★Info

Listing 1

```
470 FOR n%=1 TO 90
480 IF n%>hbuf%>0 last%>n%
490 NEXT
500 ENDPROC
510 :
520 DEF PROCprint
530 VDU 2,1,27,1,64
540 VDU 1,27,1,65,1,8
550 PRINT gim$:
560 FOR n%=0 TO W%-1
570 ch%>n%?tbuf%
580 PRINT;CHR$(1);CHR$(ch%);
590 NEXT
600 PRINT
610 FOR line%=1 TO last%
620 data%>line%?hbuf%
630 PRINT gim$:
640 FOR n%=0 TO W%-1
650 vl%>n%?vbuf%
660 tp%>n%?tbuf%
670 IF line%>last% vl%>FNlast
680 PRINT;CHR$(1);FNbyte;
690 NEXT
700 VDU 1,13,1,10
710 NEXT
720 PRINT
730 VDU 1,27,1,64,1,10,3
740 ENDPROC
750 :
760 DEF FNlast
770 IF vl%>0 THEN =>0
780 loop%>-1
790 REPEAT
800 loop%>loop%+1
810 UNTIL (data%>AND 2*loop%>=2*loop%
820 =>256-(2*loop%
830 :
840 DEF FNbyte
850 IF tp%>0 AND vl%>0 AND data%>0 THE
N =CHR$(0)
860 IF tp%>1 AND vl%>0 AND data%>0 THE
N =CHR$(0)
870 IF tp%>0 AND vl%>0 AND data%>0 THE
N =CHR$(vl%)
880 IF tp%>0 AND vl%>0 AND data%>0 THE
N =CHR$(0)
890 IF tp%>1 AND vl%>0 AND data%>0 THE
N =CHR$(vl%)
900 IF tp%>1 AND vl%>0 AND data%>0 THE
N =CHR$(data%)
910 IF tp%>0 AND vl%>0 AND data%>0 THE
N =CHR$(vl%)
920 IF tp%>1 AND vl%>0 AND data%>0 THE
N =CHR$(vl%)
930 :
940 DEF PROCChoriz(a%)
950 row%>a% DIV 8
960 mod%>a% MOD 8
970 IF mod%>0 row%>row%+1:hbuf%>row%>h
buf%>row% OR 2*(8-mod%)
980 IF mod%>0 hbuf%>row%>hbuf%>row% OR
1
990 ENDPROC
1000 :
1010 DEF PROCinit
1020 W%>480
1030 gim%>CHR$1+CHR$27+CHR$1+CHR$75+CHR
$1+CHR$(W% MOD 256)+CHR$1+CHR$(W% DIV 25
6)
1040 DIM tbuf% 480,vbuf% 480,hbuf% 90
1050 FOR n%=0 TO 480
1060 tbuf%>n%>0
1070 vbuf%>n%>0
1080 NEXT
1090 FOR n%=0 TO 90
1100 hbuf%>n%>0
1110 NEXT
1120 ENDPROC
```

Listing 2

```
10 REM >Numbers (Info2)
20 REM Countdown Numbers Game Solver
30 REM by Michael Rozdoba
40 REM for 32-bit machines
50 REM (c) BAU March 1992
60 :
70 MODE 0
80 PROCinit
90 ON ERROR IF ERR<>17 OR INKEY-1 REP
ORT:PRINT "at line ";ERR:END
100 REPEAT
110 CLG
120 PRINT"Enter Numbers:"
130 FOR q%>0 TO 5
140 p%!(12*q%>q%
150 p%!(12*q%>4)=q%-1
160 p%!(12*q%>4)=3
170 NEXT
180 FOR q%>0 TO 20 STEP 4
190 INPUTTAB(15+q%,0)n%!q%
200 NEXT
210 INPUT"Target : "lans%'
220 TIME=>0
230 CALL solve
240 PRINT"Time: ";TIME/100''
250 PRINT"any key to repeat"
260 k%>GET
```



```
10 REM >MicroArt32 (Info3)
20 REM By Duncan Lilly
30 REM Based on PC version by Mike Wi
```

```

liams
40 REM For 32 bit machines only
50 REM (C) BAU March 1992
60 :
70 MODE 13
80 OFF
90 *FX 4,1
100 PROCass
110 plot=increment
120 PROCSetup
130 PROCrand
140 xcent=0
150 ycent=0
160 oscale=0
170 cang =0
180 cplot =0
190 opal =0
200 new =TRUE
210 :
220 REPEAT
230 IF new OR xcent<>xcent OR ycent<>
oycent OR scale<>oscale OR ang<>oang OR
plot<>oplot OR pal<>opal THEN
240 CLS
250 x=0
260 y=0
270 xcent=xcent
280 ycent=ycent
290 oscale=scale
300 cang=ang
310 cplot=plot
320 opal=pal
330 PROCpalette(pal)
340 new=FALSE
350 ENDIF
360 sin=scale*SINRAD(ang)
370 cos=scale*COSRAD(ang)
380 REPEAT
390 xp=y-SGNx*d*ABS(b*x-c)
400 ya=x
410 x=xp
420 A=xcent+x*sin+y*cos
430 B=ycent+x*cos-y*sin
440 CALL plot
450 g$=INKEY$(0)
460 UNTIL g$<=" "
470 IF g$="0" AND g$<STR$palettes pal
=VAL$g
480 CASE g$ OF
490 WHEN " ", "<","<": ang=(ang+360/5)MOD3
60
500 WHEN " ", ">": ang=(ang+360/5)MOD3
60
510 WHEN "+","=": scale+=0.05
520 WHEN "-","_": IF scale>0.05 scale
=-0.05
530 WHEN CHR$136 : xcent+=8
540 WHEN CHR$137 : xcent+=8
550 WHEN CHR$138 : ycent+=8
560 WHEN CHR$139 : ycent+=8
570 WHEN " " : PROCrand
580 WHEN "I","I" : IF plot=cycle plot=
increment
590 WHEN "c","C" :
600 IF plot=increment THEN
610 plot=cycle
620 !count=!timer
630 !colour=?COLTAB
640 ENDIF
650 ENDCASE
660 UNTIL 0
670 END
680 :
690 DEF PROCrand
700 xcent=160;ycent=128
710 a= (RND(1)*2000)-1000
720 b= (RND(1)*4)-2
730 c= (RND(1)*2000)-1000
740 d=1/((RND(1)*24)-12)
750 !timer=RND(600)+200
760 scale=1
770 new=TRUE
780 ENDPROC
790 :
800 DEF PROCass
810 DIM code 800
820 FOR pass=0 TO 2 STEP 2:P%=code
830 [OPT pass
840 .cycle LDR R10,Screen
850 CMP R0,#320
860 MOVCS PC,R14
870 CMP R1,#256
880 MOVCS PC,R14
890 ADD R10,R10,R1,ASL #6
900 ADD R10,R10,R1,ASL #8
910 LDRB R1,colour
920 STRB R1,[R10,R0]
930 LDR R0,count
940 SUBS R0,R0,#1
950 STR R0,count
960 MOVPL PC,R14
970 LDR R0,timer
980 STR R0,count
990 ADR R10,Coltab
1000 LDRB R0,[R10,R1]
1010 CMP R0,R1
1020 LDRQB R0,Coltab
1030 STRB R0,colour
1040 MOV PC,R14
1050 :
1060 .colour EQUQ 0
1070 .count EQUQ 0

```

```

290 UNTIL g$<=""
300 :
310 IF g$="," THEN ang=(ang+360+5)MOD3
60
320 IF g$="." THEN ang=(ang+360+5)MOD3
60
330 IF g$=";" THEN scale=scale+0.05
340 IF g$="-" THEN IF scale>0.05 scale
=scale-0.05
350 IF ASC(g$)=136 THEN xcent=xcent-8
360 IF ASC(g$)=137 THEN xcent=xcent+8
370 IF ASC(g$)=138 THEN ycent=ycent-8
380 IF ASC(g$)=139 THEN ycent=ycent+8
390 IF g$="I" THEN PROCrand
400 IF g$="T" THEN IF plot=cycle plot=
inc:count=0:col=0
410 IF g$="C" THEN IF plot=inc plot=cyc
cle
420 UNTIL 0
430 END
440 :
450 DEF PROCrand
460 xcent=160:ycent=128
470 a= (RND(1)*2000)-1000
480 b= (RND(1)*4)-2
490 c= (RND(1)*2000)-1000
500 d=1/((RND(1)*24)-12)
510 timer=RND(2000)+500
520 scale=1
530 new=TRUE
540 ENDPROC
550 :
560 DEF PROCsetup
570 ang = 0
580 x = 0
590 y = 0
600 oxcent = 0
610 oycent = 0
620 oscale = 0
630 oang = 0
640 oplot = 0
650 new = TRUE
660 cycle = 1
670 inc = 2
680 FOR col=0 TO 7
690 READ vdu
700 VDU 19,col,vdu;0;
710 NEXT
720 ENDPROC
730 :
740 DATA 0,4,1,5,2,6,3,7
750 :
760 DEF PROCa
770 CLS
780 x=0
790 y=0
800 oxcent=xcent
810 oycent=ycent
820 oscale=scale
830 oang=ang
840 oplot=plot
850 new=FALSE
860 colour=0
870 count=0
880 ENDPROC

```

Listing 5

```

10 REM >Fire32 (Info5)
20 REM by Ian Vibe
30 REM for 32-bit machines
40 REM (c) BAU March 1992
50 :
60 MODE 12
70 OFF
80 DIM c1%(15),c2%(15),c3%(15)
90 FOR n%=1 TO 15
100 f1%=24*n%
110 f2%=f1%+120
120 f3%=f1%+240
130 c1%(n%)=128*(SINradf1%+1)
140 c2%(n%)=128*(SINradf2%+1)
150 c3%(n%)=128*(SINradf3%+1)
160 COLOUR n%,c1%(n%),c2%(n%),c3%(n%)
170 NEXT
180 REPEAT
190 f1=1
200 r%=0
210 REPEAT
220 GCOL f%
230 f%=f% MOD 15+1
240 FOR n%=0 TO 8 STEP 2
250 CIRCLE 640,512,r%+n%
260 CIRCLE 640,510,r%+n%
270 IF TIME>=4 PROCs:TIME=0
280 NEXT
290 r%+=n%
300 UNTIL r%=820
310 FOR n%=1 TO 7
320 a%=RND(30)+20
330 z=RND(1)+1
340 f%=RND(180)
350 FOR x%=0 TO 1280 STEP 2
360 y%=a%*SINRAD(y%*z+f%)
370 RECTANGLE FILL x%,0,0,1020 TO x%,y
%
380 IF TIME>=4 PROCs:TIME=0
390 NEXT
400 a%=RND(30)+20
410 z=RND(1)+1
420 f%=RND(180)
430 FOR y%=0 TO 1024 STEP 4
440 x%=a%*SINRAD(y%*z+f%)
450 RECTANGLE FILL 0,y%,1280,0 TO x%,y
%
460 IF TIME>=4 PROCs:TIME=0
470 NEXT
480 NEXT
490 TIME=0

```

```

10 REM %Pire32 (Info5)
20 REM by Ian Vibe
30 REM for 32-bit machines
40 REM (C) BAU March 1992
50 :
60 MODE 12
70 OFF
80 DIM c1%(15),c2%(15),c3%(15)
90 FOR n%=1 TO 15
100 f1%=24*n%
110 f2%=f1%+120
120 f3%=f1%+240
130 c1%(n%)=128*(SINRADf1%+1)
140 c2%(n%)=128*(SINRADf2%+1)
150 c3%(n%)=128*(SINRADf3%+1)
160 COLOUR n%,c1%(n%),c2%(n%),c3%(n%)

```

```
10 REM >MicroArt8
20 REM By Duncan Lilly
30 REM Based on PC version by Mike Wil
```

```

11iams
40 REM For all machines
50 REM (C) BAU March 1992
60 :
70 MODE 2
80 *FX 4,1
90 PROCsetup
100 PROCrand
110 plot=inc
120 :
130 REPEAT
140 IF new=TRUE OR xcent<0 OR ycent<0 OR xang<0 OR ycent<0 OR scale<0 OR scale<0 OR ang<0 OR ang>360
150 OR plot<0 OR plot THEN PROCa
160 sin=scale*SINRAD(ang)
170 cos=scale*COSRAD(ang)
180 :
190 xp=y-SGNx*d*ABs(b*x-c)
200 ya=x-a
210 x=xp
220 A=xcent+x*sin+y*cos
230 B=ycent-x*cos-y*sin
240 PLOT=inc Pts=POINT(A#4,B#4)+1
250 ELSE Pts=colour+1:count=count+1:IF count=
260 timer count*0:colour=(colour+1)MOD7
270 GCOL 0,P
280 PLOT 69,A#4,B#4
290 g$=INKEY$(0)

```



```

500 REPEAT
510 PROCa
520 k=INKEY(4)
530 UNTIL TIME>=3000
540 UNTIL FALSE
550 :
560 DEF PROCa
570 LOCAL n%
580 c1%(0)=c1%(15)
590 c2%(0)=c2%(15)
600 c3%(0)=c3%(15)
610 FOR n%=14 TO 0 STEP -1
620 c1%(n+1)=c1%(n%)
630 c2%(n+1)=c2%(n%)
640 c3%(n+1)=c3%(n%)
650 NEXT
660 FOR n%=1 TO 15
670 COLOUR n%,c1%(n%),c2%(n%),c3%(n%)
680 NEXT
690 ENDPROC

```

Listing 6

```

10 REM >Fire8 (Info6)
20 REM by Dave Acton
30 REM for eight-bit machines
40 REM (c) BAU March 1992
50 :
60 MODE 2
70 VDU 23;8202;0;0;0;19,15,0,0,0,0
80 DIM code% 180,lo% 32,hi% 32
90 DIM sqlo% 256,sqhi% 256,col% 256
100 FOR i%=0 TO 255
110 a%=i%*i%
120 sqlo%?i%=a% MOD 256
130 sqhi%?i%=a% DIV 256
140 GCOL 0,i% MOD 15
150 PLOT 69,8,1823
160 col%?i%=763000
170 NEXT
180 :
190 FOR i%=0 TO 31
200 a%=(3000+640*i%)
210 lo%?i%=a% MOD 256
220 hi%?i%=a% DIV 256
230 NEXT
240 :
250 shift%=80
260 dir%=81
270 x%=82
280 y%=83
290 FOR pass%=0 TO 2 STEP 2
300 P%=code%
310 [OPT pass%
320 .setup
330 LDA #0
340 STA dir
350 LDA #79
360 STA x
370 :
380 .setuploop1
390 JSR cycle
400 LDA #127
410 STA y
420 :
430 .setuploop2
440 LDA #80
450 SEC
460 SBC x
470 TAX
480 LDA #128
490 SEC
500 SBC y
510 LSR A
520 TAX
530 LDA sqlo%,X
540 CLC
550 ADC sqlo%,Y
560 STA #74
570 LDA sqhi%,X
580 ADC sqhi%,Y
590 STA #75
600 LDX #255
610 :
620 .findsq
630 INX
640 LDA sqhi%,X
650 CMP #75
660 BCC findsq
670 BNE foundsq
680 LDA sqlo%,X
690 CMP #74
700 BCC findsq
710 :
720 .foundsq
730 LDA col%,X
740 STA #72
750 LDX x
760 LDY y
770 JSR plot
780 LDA #159
790 SEC
800 SBC x
810 TAX
820 JSR plot
830 TYA
840 EOR #255
850 TAX
860 JSR plot
870 LDX x
880 JSR plot
890 DEC y
900 BPL setuploop2
910 DEC x
920 BPL setuploop1
930 RTS
940 :
950 .init

```

```

960 STA shift
970 CMP #0
980 BPL init2
990 LDA #64
1000 STA dir
1010 LDA #0
1020 SEC
1030 SBC shift
1040 STA shift
1050 RTS
1060 :
1070 .init2
1080 LDA #0
1090 STA dir
1100 RTS
1110 :
1120 .shiftcol
1130 JSR init
1140 ASL dir
1150 LDY #0
1160 :
1170 .shiftcolloop
1180 TYA
1190 PHA
1200 CLC
1210 ADC shift
1220 BCS off1
1230 TAX
1240 JSR peek
1250 JMP on1
1260 :
1270 .off1
1280 LDA #655
1290 STA #72
1300 :
1310 .on1
1320 PLA
1330 TAX
1340 JSR plot
1350 INY
1360 BNE shiftcolloop
1370 RTS
1380 :
1390 .shiftrow
1400 JSR init
1410 LDX #0
1420 :
1430 .shiftrowloop
1440 TXA
1450 PHA
1460 CLC
1470 ADC shift
1480 CMP #160
1490 BCS off2
1500 TAX
1510 JSR peek
1520 JMP on2
1530 :
1540 .off2
1550 LDA #655
1560 STA #72
1570 :
1580 .on2
1590 PLA
1600 TAX
1610 JSR plot
1620 INX
1630 CPY #160
1640 BNE shiftrowloop
1650 RTS
1660 :
1670 .peek
1680 TXA
1690 PHA
1700 TYA
1710 PHA
1720 JSR getaddr
1730 TXA
1740 AND #1
1750 BNE peek2
1760 LDA (#70),Y
1770 LSR A
1780 JMP peek3
1790 :
1800 .peek2
1810 LDA (#70),Y
1820 :
1830 .peek3
1840 AND #655
1850 STA #72
1860 PLA
1870 TAX
1880 PLA
1890 TAX
1900 RTS
1910 :
1920 .plot
1930 LDA #72
1940 PHA
1950 TYA
1960 PHA
1970 TYA
1980 PHA
1990 JSR getaddr
2000 TXA
2010 AND #1
2020 BNE plot2
2030 ASL #72
2040 LDA (#70),Y
2050 AND #655
2060 JMP plot3
2070 :
2080 .plot2
2090 LDA (#70),Y
2100 AND #AA
2110 :
2120 .plot3
2130 ORA #72
2140 STA (#70),Y

```

```

2150 PLA
2160 TAX
2170 PLA
2180 TAX
2190 PLA
2200 STA #72
2210 RTS
2220 :
2230 .getaddr
2240 BIT dir
2250 BPL dontinvy
2260 TYA
2270 EOR #255
2280 TAX
2290 :
2300 .dontinvy
2310 BIT dir
2320 BVC dontinvx
2330 STX #73
2340 LDA #159
2350 SEC
2360 SBC #73
2370 TAX
2380 :
2390 .dontinvx
2400 LDA #0
2410 STA #71
2420 TXA
2430 AND #254
2440 ASL A
2450 ROL #71
2460 ASL A
2470 ROL #71
2480 STA #70
2490 TYA
2500 AND #7
2510 ORA #70
2520 STA #70
2530 TYA
2540 LSR A
2550 LSR A
2560 LSR A
2570 TAX
2580 LDA lo%,Y
2590 CLC
2600 ADC #70
2610 STA #70
2620 LDA hi%,Y
2630 ADC #71
2640 STA #71
2650 LDY #0
2660 RTS
2670 :
2680 .cycle
2690 LDX #14
2700 :
2710 .cycleloop
2720 LDA #19
2730 JSR &FFEE
2740 TXA
2750 JSR &FFEE
2760 TXA
2770 CLC
2780 ADC stage
2790 AND #15
2800 LSR A
2810 LSR A
2820 TAX
2830 LDA cols,Y
2840 JSR &FFEE
2850 LDA #0
2860 JSR &FFEE
2870 JSR &FFEE
2880 JSR &FFEE
2890 DEX
2900 BPL cycleloop
2910 DEC stage
2920 RTS
2930 :
2940 .stage EQU 0
2950 .cols EQU &1050705
2960 ]
2970 NEXT pass%
2980 :
2990 CALL setup
3000 FOR n%=1 TO 3
3010 a%=RND(8)+6
3020 z=RND(1)+1
3030 f%=RND(180)
3040 FOR X%=0 TO 159
3050 CALL cycle
3060 A%=a%*SINRAD((8*X%)*z+f%)
3070 CALL shiftcol
3080 NEXT
3090 a%=RND(4)+3
3100 z=RND(1)+1
3110 f%=RND(180)
3120 FOR Y%=0 TO 255
3130 CALL cycle
3140 A%=a%*SINRAD(4*Y%*z+f%)
3150 CALL shiftrow
3160 NEXT
3170 NEXT
3180 REPEAT
3190 *FX 19
3200 CALL cycle
3210 UNTIL FALSE
3220 END

```

Listing 7

```

10 REM >Henon curve plotter (Info7)
20 REM by Michael Rozdoba
30 REM For 32-bit machines
40 REM (c) BAU March 1992
50 :
60 ON ERROR ON:REPORT:PRINT" at line
";ERL:END
70 PROCinitialise

```

```

80 CLS
90 CALL henon
100 END
110 :
120 DEF PROCinitialise
130 SYS "OS.Byte",161,133 TO ,,type%
140 type%=(type% AND 12) DIV 4
150 IF type%=1 THEN
160 MODE 18
170 v%=512
180 m2%=&FFFFFFFE
190 ELSE
200 MODE 0
210 v%=256
220 m2%=&FFFFFFFC
230 ENDIF
240 COLOUR 1,255,255,0
250 OFF
260 PROCAssemble
270 zoom=.9
280 PROCset(azoom,zoom)
290 PROCset(aunzm,1/zoom)
300 MOUSE OFF
310 MOUSE RECTANGLE -1024,-1024,2048,2
048
320 ENDPROC
330 :
340 DEF PROCAssemble
350 mem%=2048
360 DIM code% mem%
370 !code%=-148
380 code%?4=-1
390 SYS "OS_ReadVduVariables",code%,co
de%
400 scrat=!code%
410 L%=code%+mem%
420 FOR pass%=8 TO 10 STEP 2
430 P%=code%
440 [OPT pass%
450 .aniter EQU 3000
460 .account EQU 0
470 .aa EQU 0
480 .ab EQU 0
490 .as EQU 197
500 .axm EQU &66F5C2
510 .sym EQU &14978D
520 .ascrat EQU scrat+40*v%+40
530 .ax EQU 0:EQU &A990DEE2
540 EQU &00000000
550 .ay EQU 1:EQU &F3F039B8
560 EQU &FFFFFFFC
570 .stpos EQU 3:EQU 0:EQU 0
580 EQU 0:EQU 0:ALIGN
590 .henon
600 STMPD R13!,(R14)
610 :
620 .mainloop
630 MOV R0,#21
640 ADR R1,stpos
650 SWI "OS.Word"
660 :
670 ADR R14,ax
680 LDIA R14,(R0-R5)
690 LDR R11,aniter
700 STR R11,account
710 :
720 .loop
730 CMP R4,#0
740 RSBNE R9,R5,#1
750 MOVNE R4,R4,LSR R9
760 CMENE R3,#0
770 ADDEQ R7,R4,#(1<<31)
780 MOVEQ R8,#1
790 MOVNE R8,#0
800 RSBNE R4,R4,#(1<<31)
810 ADDNE R7,R4,R4
820 MOV R6,#0
830 MOV R3,R0
840 MOV R4,R1
850 SUB R5,R2,#2
860 ADD R2,R2,R2
870 MOV R10,#(1<<16)
880 SUB R10,R10,#1
890 AND R10,R10,R1
900 MOV R1,R1,LSR #16
910 MUL R9,R10,R10
920 MUL R0,R10,R1
930 MUL R10,R1,R1
940 ADDS R0,R0,R0
950 ADDCS R10,R10,#(1<<16)
960 ADDS R9,R9,R0,LSL #16
970 ADCS R1,R10,R0,LSR #16
980 ADDEPL R1,R1,R1
990 SUBPL R2,R2,#1
1000 MOVPL R10,R9,LSR #31
1010 ORRPL R1,R1,R10
1020 MOV R0,#1
1030 :
1040 ADDS R1,R1,R1,LSR #1
1050 MOVCS R1,R1,RRX
1060 ADDCS R2,R2,#1
1070 CMP R1,#0
1080 MOVEQ R0,R6
1090 MOVEQ R1,R7
1100 MOVEQ R2,R8
1110 BEQ adddone
1120 SUBS R9,R2,R8
1130 SUBMI R9,R8,R2
1140 MOVPL R7,R7,LSR R9
1150 MOVMI R1,R1,LSR R9
1160 MOVMI R2,R8
1170 CMP R0,R6
1180 BEQ addpt
1190 SUBS R1,R1,R7
1200 BEQ addcne
1210 MOVLO R0,R6
1220 RSBLOS R1,R1,#0
1230 :
1240 .addloop

```




```
1250 SUBPL R2,R2,#1
1260 ADDPLS R1,R1,R1
1270 BPL addloop
1280 B adddone
1290 :
1300 .addpt
1310 ADDS R1,R1,R7
1320 MOVCS R1,R1,RRX
1330 ADDCS R2,R2,#1
1340 :
1350 .addone
1360 RSB R14,R2,#10
1370 MOV R9,R1,LSR R14
1380 RSB R14,R5,#10
1390 MOV R10,R4,LSR R14
1400 CMP R0,#1
1410 RSBEQ R9,R9,#0
1420 CMP R3,#1
1430 RSBEQ R10,R10,#0
1440 STMPD R13!,(R0-R5)
1450 ADR R14,aa
1460 LDMIA R14,(R0-R5)
1470 SUBS R9,R9,R0
1480 MOVPL R0,R9
1490 RSBMI R0,R9,#0
1500 SUBS R10,R1,R10
1510 MOVPL R1,R10
1520 RSBMI R1,R10,#0
1530 CMP R0,R3
1540 RGE next
1550 CMP R1,R4
1560 RGE next
1570 MUL R9,R2,R9
1580 MUL R10,R2,R10
1590 MOV R1,R9,ASR #22
1600 MOV R2,R10,ASR #21,(v%512)
1610 ADD R2,R2,R2,ASL #2
1620 ADD R5,R5,R2,ASL #4
1630 LDRB R14,[R5,R1,ASR #3]!
1640 AND R1,R1,#7
1650 MOV R2,#1
1660 MOV R2,R2,LSL R1
1670 ORR R14,R14,R2
1680 STRB R14,[R5]
1690 :
1700 .next
1710 LDMFD R13!,(R0-R5)
1720 LDR R11,account
1730 SUBS R11,R11,#1
1740 STR R11,account
1750 RNE loop
1760 ADR R14,ax
1770 STMIA R14,(R0-R5)
1780 SWI "OS_ReadEscapeState"
1790 LDMCSFD R13!,(PC)
1800 SWI "OS_Mouse"
1810 CMP R2,#0
1820 BEQ mainloop
1830 ADR R14,amasks
1840 LDMIA R14,(R3,R4)
1850 AND R0,R0,R3
1860 AND R1,R1,R4
1870 TST R2,#2
1880 BEQ checkselect
1890 STMPD R13!,(R2)
1900 MOV R9,R0
1910 MOV R10,R1
1920 MOV R0,R4
1930 MOV R1,#1280
1940 SUB R1,R1,#1
1950 MOV R2,#1024
1960 SUB R2,R2,#1
1970 SWI "OS_Plot"
1980 MOV R0,R4
1990 MOV R1,#0
2000 MOV R2,#0
2010 SWI "OS_Plot"
2020 MOV R0,#185
2030 RSB R1,R9,#0
2040 RSB R2,R10,#0
2050 SWI "OS_Plot"
2060 CMP R9,#0
2070 MOVPL R3,#0
2080 MOVMI R3,#1
2090 RSBMI R9,R9,#0
2100 MOV R5,#22
2110 MOV R4,R9
2120 BEQ 12
2130 :
2140 .11
2150 MOV R4,R4,LSL #1
2160 SUB R5,R5,#1
2170 BPL 11
2180 :
2190 .12
2200 ADR R14,afx
2210 STMIA R14,(R3-R5)
2220 CMP R10,#0
2230 MOVPL R3,#0
2240 MOVMI R3,#1
2250 RSBMI R10,R10,#0
2260 MOV R5,#22
2270 MOV R4,R10
2280 BEQ 14
2290 :
2300 .13
2310 MOV R4,R4,LSL #1
2320 SUB R5,R5,#1
2330 BPL 13
2340 :
2350 .14
2360 ADR R14,afx
2370 LDMIA R14,(R0-R2)
2380 FPMul
2390 ADR R14,afb
2400 LDMIA R14,(R3-R5)
2410 FPNadd
2420 ADR R14,afb
2430 STMIA R14,(R0-R2)
2440 RSB R2,R2,#12
2450 MOV R1,R1,LSR R2
2460 CMP R0,#1
2470 RSBEQ R1,R1,#0
2480 STR R1,ab
2490 ADR R14,afb
2500 LDMIA R14,(R0-R2)
2510 ADR R14,afx
2520 LDMIA R14,(R3-R5)
2530 FPMul
2540 ADR R14,afa
2550 LDMIA R14,(R3-R5)
2560 FPNadd
2570 ADR R14,afa
2580 STMIA R14,(R0-R2)
2590 RSB R2,R2,#10
2600 MOV R1,R1,LSR R2
2610 CMP R0,#1
2620 RSBEQ R1,R1,#0
2630 STR R1,aa
2640 LDMFD R13!,(R2)
2650 :
2660 .checkselect
2670 TST R2,#4
2680 BEQ checkadjust
2690 ADR R0,azoom
2700 BL rescale
2710 B mainloop
2720 :
2730 .checkadjust
2740 TST R2,#1
2750 BEQ mainloop
2760 LDR R0,as
2770 CMP R0,#128
2780 BLE mainloop
2790 ADR R0,aunzm
2800 BL rescale
2810 B mainloop
2820 :
2830 .amasks EQUDEF FFFFFFFF:EQUDEF m2%
2840 .afs EQUDEF 0:EQUDEF &A6666666
2850 EQUDEF 2
2860 .afa EQUDEF 0:EQUDEF 0
2870 .afb EQUDEF 0:EQUDEF 0
2880 .afx EQUDEF 0:EQUDEF 0
2890 .azoom EQUDEF 0:EQUDEF 0
2900 .aunzm EQUDEF 0:EQUDEF 0
2910 .axmac EQUDEF 0:EQUDEF &9E666666
2920 EQUDEF 22
2930 .aymac EQUDEF 0:EQUDEF &FD70A3D6
2940 EQUDEF 19
2950 :
2960 .rescale
2970 STMPD R13!,(R14)
2980 LDMIA R0,(R0-R2)
2990 ADR R14,afb
3000 LDMIA R14,(R3-R5)
3010 FPMul
3020 ADR R14,afb
3030 STMIA R14,(R0-R2)
3040 FPMov(10,0)
3050 ADR R14,axmac
3060 LDMIA R14,(R3-R5)
3070 FPMul
3080 RSB R2,R2,#32
3090 MOV R1,R1,LSR R2
3100 CMP R0,#1
3110 RSBEQ R1,R1,#0
3120 STR R1,axm
3130 FPMov(0,10)
3140 ADR R14,aymac
3150 LDMIA R14,(R3-R5)
3160 FPMul
3170 RSB R2,R2,#32
3180 MOV R1,R1,LSR R2
3190 CMP R0,#1
3200 RSBEQ R1,R1,#0
3210 STR R1,aym
3220 FPMov(3,10)
3230 MOV R0,#0
3240 MOV R1,#(1<<31)
3250 MOV R2,#10
3260 FPNdiv
3270 RSB R2,R2,#31
3280 MOV R1,R1,LSR R2
3290 CMP R0,#1
3300 RSBEQ R1,R1,#0
3310 ADD R1,R1,#1
3320 MOV R1,R1,ASR #1
3330 STR R1,as
3340 SWI 256+12
3350 LDMFD R13!,(PC)
3360 :
3370 .mul FPMulass
3380 MOV PC,R14
3390 .add FPNaddass
3400 MOV PC,R14
3410 .div FPNdivass
3420 MOV PC,R14
3430 :
3440 NEXT
3450 ENDPROC
3460 :
3470 :
3480 DEF FPMov(d%,l%)
3490 [OPT pass%
3500 MOV d%,l%
3510 MOV (d%+1),(l%+1)
3520 MOV (d%+2),(l%+2)
3530 ]
3540 =0
3550 DEF FPNaddass
3560 [OPT pass%
3570 CMP R4,#0
3580 BEQ P%+4*24
3590 CMP R1,#0
3600 MOVEQ R0,R3
3610 MOVEQ R1,R4
3620 MOVEQ R2,R5
3630 BEQ P%+4*19
3640 SUBS R6,R2,R5
3650 SUBMI R6,R5,R2
3660 MOVPL R4,R4,LSR R6
3670 MOVMI R1,R1,LSR R6
3680 MOVMI R2,R5
3690 CMP R0,R3
3700 BEQ P%+4*9
3710 SUBS R1,R1,R4
3720 BEQ P%+4*10
3730 MOVLO R0,R3
3740 RSBLOS R1,R1,#0
3750 SUBPL R2,R2,#1
3760 MOVPLS R1,R1,LSL #1
3770 BPL P%+4*2
3780 B P%+4*4
3790 ADDS R1,R1,R4
3800 MOVCS R1,R1,RRX
3810 ADDCS R2,R2,#1
3820 ]
3830 =0
3840 DEF FPNadd
3850 [OPT pass%
3860 BL add
3870 ]
3880 =0
3890 DEF FPMulass
3900 [OPT pass%
3910 EOR R0,R0,R3
3920 ADD R2,R2,R5
3930 MOV R6,#1<<16
3940 SUB R6,R6,#1
3950 MOV R7,R1,LSR #16
3960 MOV R8,R4,LSR #16
3970 AND R1,R1,R6
3980 AND R4,R4,R6
3990 MUL R9,R1,R4
4000 MUL R6,R7,R8
4010 MUL R7,R4,R7
4020 MUL R8,R1,R8
4030 ADDS R7,R7,R8
4040 ADDCS R6,R6,#1<<16
4050 ADDS R9,R9,R7,LSL #16
4060 ADCS R1,R6,R7,LSR #16
4070 MOVPL R1,R1,LSL #1
4080 SUBPL R2,R2,#1
4090 MOVPL R6,R9,LSR #31
4100 ORPL R1,R1,R6
4110 ]
4120 =0
4130 DEF FPMul
4140 [OPT pass%
4150 BL mul
4160 ]
4170 =0
4180 DEF FPNdivass
4190 [OPT pass%
4200 SUB R2,R2,R5
4210 EOR R0,R0,R3
4220 MOV R6,#0
4230 MOV R7,R1
4240 MOV R1,#0
4250 MOV R8,R32
4260 CMP R6,#1
4270 CMPL0 R7,R4
4280 ADD R1,R1,R1
4290 ADHS R1,R1,#1
4300 ADDLO R6,R6,#1
4310 SUBHSS R7,R7,R4
4320 SBC R6,R6,#0
4330 ADDS R7,R7,R7
4340 ADC R6,R6,R6
4350 SUBS R8,R8,#1
4360 RNE P%+4*10
4370 CMP R6,#1
4380 CMPL0 R7,R4
4390 ADCS R1,R1,R1
4400 MOVCS R1,R1,RRX
4410 ADDCS R2,R2,#1
4420 ]
4430 =0
4440 DEF FPNdiv
4450 [OPT pass%
4460 BL div
4470 ]
4480 =0
4490 DEF PROCset(a%,n)
4500 LOCAL A%,B%,C%,an
4510 IF n=0 THEN
4520 A%=0
4530 B%=0
4540 C%=0
4550 ELSE
4560 A%=(1-SGN n)/2
4570 an=ABS n
4580 C%=INT((LNan/LN2+1+IE-8)
4590 B%=(an*2^(31-C%))<<1)
4600 ENDF
4610 !a%=A%
4620 a%14=B%
4630 a%18=C%
4640 ENDPROC
150 EQUDEF quit
160 EQUDEF 0
170 EQUDEF title
180 EQUDEF help
190 EQUDEF commandtable
200 :
210 .title EQUDEF "Handy"
220 EQUDEF 0
230 ALIGN
240 :
250 .help EQUDEF "Handy"+CHR$9+CHR$
9+1.00 (04 Jan 1992)"
260 EQUDEF 0
270 ALIGN
280 :
290 .quit STMPD (sp)!,(link)
300 BL off
310 LDMFD (sp)!,(pc)
320 :
330 .commandtable
340 EQUDEF "HandyOn"
350 EQUDEF 0
360 ALIGN
370 EQUDEF on
380 EQUDEF 0
390 EQUDEF onsyn
400 EQUDEF onhlp
410 EQUDEF "HandyOff"
420 EQUDEF 0
430 ALIGN
440 EQUDEF off
450 EQUDEF 0
460 EQUDEF offsyn
470 EQUDEF offhlp
480 EQUDEF 0
490 :
500 .onhlp EQUDEF ""+CHR$27+CHR$0+"
enables the SHIFT/CTRL lock."
510 EQUDEF 13
520 .onsyn EQUDEF CHR$27+CHR$1
530 EQUDEF 0
540 .offhlp EQUDEF ""+CHR$27+CHR$0+"
disables the SHIFT/CTRL lock."
550 EQUDEF 13
560 .offsyn EQUDEF CHR$27+CHR$1
570 EQUDEF 0
580 :
590 .on BIC link,link,#1<<28
600 STMPD (sp)!,(r0-r12,link)
610 MOV r3,#14
620 B cutin
630 .off BIC link,link,#1<<28
640 STMPD (sp)!,(r0-r12,link)
650 MOV r3,#13
660 .cutin LDR r0,inuse
670 CMP r0,r3
680 LDMQFDD (sp)!,(r0-r12,pc)
690 MOV r0,eventv
700 ADR r1,event
710 MOV r2,#0
720 CMP r3,#14
730 SWIEQ "XOS_Claim"
740 CMP r3,#13
750 SWIEQ "XOS_Release"
760 MOV r0,r3
770 MOV r1,#11
780 SWI "XOS_Byte"
790 MOV r1,#2
800 SWI "XOS_Byte"
810 STR r3,inuse
820 LDMFD (sp)!,(r0-r12,pc)
830 :
840 .mask EQUDEF 0
850 .inuse EQUDEF 13
860 :
870 .keys EQUDEF &3B40
880 EQUDEF &6140
890 EQUDEF &4C08
900 EQUDEF &5808
910 EQUDEF -1
920 :
930 .event STMPD (sp)!,(r0-r12,link)
940 CMP r0,#2
950 MOVEQ r1,#1
960 BEQ callb
970 CMP r0,#11
980 CMPEQ r1,#0
990 LDMNEFD (sp)!,(r0-r12,pc)^
1000 ADR r3,keys
1010 :
1020 .findk LDR r0,[r3],#4
1030 CMP r0,#0
1040 LDMLTFFD (sp)!,(r0-r12,pc)^
1050 CMP r2,r0,LSR #8
1060 BNE findk
1070 LDRB r1,mask
1080 EOR r0,r0,r1
1090 STRB r0,mask
1100 MOV r1,#0
1110 :
1120 .callb ADR r0,set
1130 MOV r9,pc
1140 ORR r8,r9,#3
1150 TEQP r8,#0
1160 MOVNV r0,r0
1170 STMPD (sp)!,(link)
1180 SWI "XOS_AddCallBack"
1190 LDMFD (sp)!,(link)
1200 TEQP r9,#0
1210 MOVNV r0,r0
1220 LDMFD (sp)!,(r0-r12,pc)^
1230 :
1240 .set STMPD (sp)!,(r0-r12,link)
1250 MOV r0,#202
1260 MOV r1,#0
1270 MOV r2,#255
1280 SWI "XOS_Byte"
```

Listing 8

```
10 REM >Handy32 (Info8)
20 REM by Dave Acton
30 REM for 32-bit machines
40 REM (c) BAU March 1992
50 :
60 DIM code% &400
70 eventv=&10
80 sp=13:link=14:pc=15
90 FOR pass%=4 TO 6 STEP 2
100 P%=0
110 O%=code%
120 [OPT pass%
130 EQUDEF 0
140 EQUDEF 0
```



```

1290 LDRB r3,mask
1300 CMP r12,#0
1310 ORREQ r1,r1,r3
1320 BICNE r1,r1,r3
1330 MOV r2,#0
1340 STRNE r2,mask
1350 SWI "XOS_Byte"
1360 LDMFD (sp)!,(r0-r12,pc)"
1370 ]
1380 NEXT pass%
1390 SYS "OS_File",10,"Handy",&FFA,,cod
e%,0%
1400 END

```

Listing 9

```

10 REM >Handy8 (Info9)
20 REM by Dave Acton
30 REM for eight-bit machines
40 REM (c) BAU March 1992
50 :
60 bytev=&20A
70 rdchv=&210
80 eventv=&220
90 keyv=&228
100 osbyte=&FF4
110 FOR pass%=&0 TO 2 STEP 2
120 P%=&900
130 [OPT pass%
140 SEI
150 OPT FNR(eventv,oldevent+1,myevent)
160 OPT FNR(rdchv,oldrdch+1,myrdch)
170 OPT FNR(bytev,oldbyte+1,mybyte)
180 CLI
190 LDA #14
200 LDX #4
210 JMP osbyte
220 :
230 .mybyte
240 CMP #129
250 BNE mybyte2
260 CPY #255
270 BNE inkeyplus
280 CPX #254
290 BCC mybyte2
300 BEQ inkeyminus2
310 LDA mask
320 AND #128
330 JMP mybyte1
340 :
350 .inkeyminus2
360 LDA mask
370 AND #64
380 :
390 .mybyte1
400 PHP
410 LDA #129
420 LDX #0
430 LDY #0
440 PLP
450 BEQ isntpressed
460 DEX
470 DEY
480 :
490 .isntpressed
500 RTS
510 :
520 .inkeyplus
530 JSR oldbyte
540 PHP
550 CPY #0
560 BNE nokeypressed
570 STX temp+2
580 JSR convert
590 LDX temp+2
600 :
610 .nokeypressed
620 PLP
630 RTS
640 :
650 .mybyte2
660 .oldbyte
670 JMP &ABCD
680 :
690 .myrdch
700 .oldrdch"
710 JSR &ABCD
720 STA temp+2
730 :
740 .convert
750 PHP
760 TXA
770 PHA
780 TYA
790 PHA
800 BIT mask
810 BPL notctrl
820 LDA #227
830 JSR dofunc
840 BCC converted
850 LDA temp+2
860 CMP #64
870 BCC converted
880 CMP #64+32
890 BCS trylc
900 EOR #64
910 STA temp+2
920 JMP converted
930 :
940 .trylc
950 CMP #ASC"a"
960 BCC converted
970 CMP #ASC"z"+1
980 BCS converted
990 SEC
1000 SBC #96
1010 STA temp+2
1020 JMP converted
1030 :
1040 .notctrl
1050 BIT mask
1060 BVC converted
1070 LDA temp+2
1080 CMP #ASC"a"
1090 BCC checkshift
1100 CMP #ASC"z"+1
1110 BCS checkshift
1120 SBC #31
1130 BNE shifted ; = JMP
1140 :
1150 .checkshift
1160 LDA #226
1170 JSR dofunc
1180 BCC converted
1190 LDX #254
1200 :
1210 .findshift
1220 INX
1230 INX
1240 LDA shift,X
1250 BEQ converted
1260 CMP temp+2
1270 BNE findshift
1280 LDA shift+1,X
1290 :
1300 .shifted
1310 STA temp+2
1320 :
1330 .converted
1340 LDA #0
1350 STA mask
1360 PLA
1370 TAY
1380 PLA
1390 TAX
1400 LDA temp+2
1410 PLP
1420 RTS
1430 :
1440 .dofunc
1450 STA temp+5
1460 LDA #225
1470 JSR getinfo
1480 BCC notfunc
1490 STX temp+3
1500 LDA temp+2
1510 CMP temp+3
1520 BCC notfunc
1530 SEC
1540 SBC #16
1550 CMP temp+3
1560 BCS notfunc
1570 LDA temp+5
1580 JSR getinfo
1590 BCC notfunc
1600 TXA
1610 CLC
1620 ADC temp+2
1630 SEC
1640 SBC temp+3
1650 STA temp+2
1660 CLC
1670 RTS
1680 :
1690 .notfunc
1700 SEC
1710 RTS
1720 :
1730 .getinfo
1740 LDX #0
1750 LDY #255
1760 JSR osbyte
1770 CPX #2
1780 RTS
1790 :
1800 .shift
1810 EQU$ "112""3#4$5%&7'8(9)0-+=~`|{
( ) _ , ; * , < , > / ? "
1820 EQU$ 0
1830 :
1840 .myevent
1850 PHP
1860 PHA
1870 CMP #4
1880 BNE notouevent
1890 TXA
1900 PHA
1910 TYA
1920 PHA
1930 CLC
1940 CLV
1950 JSR callkeyv
1960 PHA
1970 AND #64
1980 CMP status
1990 BEQ event2
2000 STA status
2010 CMP #0
2020 BEQ event2
2030 LDA mask
2040 EOR #64
2050 STA mask
2060 :
2070 .event2
2080 PLA
2090 AND #128
2100 CMP status+1
2110 BEQ eventdone
2120 STA status+1
2130 CMP #0
2140 BEQ eventdone
2150 LDA mask
2160 EOR #128
2170 STA mask
2180 :
2190 .eventdone
2200 PLA
2210 TAX

```

```

2220 PLA
2230 TAY
2240 :
2250 .notouevent
2260 PLA
2270 PLP
2280 :
2290 .oldevent
2300 JMP &ABCD
2310 :
2320 .callkeyv
2330 JMP (keyv)
2340 :
2350 status EQU$ 0
2360 mask EQU$ 0
2370 temp EQU$ 0:EQU$ 0
2380 ]
2390 NEXT pass%
2400 PRINT"Bytes used: ";P%-&900
2410 OSCILL("SAVE Handy 900 "+STR$P%)
2420 END
2430 :
2440 DEF FNR(v,o,m)
2450 [OPT pass%
2460 LDA v
2470 STA o
2480 LDA v+1
2490 STA o+1
2500 LDA #m MOD 256
2510 STA v
2520 LDA #m DIV 256
2530 STA v+1
2540 ]
2550 =pass%

```

Listing 10

```

10 REM >Predictor (Info10)
20 REM Pools Predictor
30 REM by Robert Place
40 REM for all machines
50 REM (c) BAU March 1992
60 :
70 DIM name$(2),pre(2)
80 REPEAT
90 CLS
100 FOR i=1 TO 2
110 PRINT"Team ";i;"
120 INPUT"Name: "name$(i)
130 INPUT"League position: "po
140 INPUT"Played: "p
150 INPUT"Won: "w
160 INPUT"Goals against: "a
170 pre(i)=(((2*p)/a*(p/w)*5)/po*4
180 PRINT"Rating for team ";i;"=";pre(i)
190 NEXT
200 IF pre(1)>pre(2) b=1 ELSE b=2
210 IF ABS(pre(1)-pre(2))<4 PRINT"Draw
" ELSE PRINT name$(b) " will win"
220 PRINT""Press any key..."
230 wait=GET
240 UNTIL FALSE

```

Listing 11

```

10 REM >Bugland (Info11)
20 REM by Dave Acton
30 REM for 32-bit machines
40 REM (c) BAU March 1992
50 :
60 MODE 13
70 OFF
80 *FX 4,1
90 *POINTER 1
100 VDU 34,0;0;1023;1023;
110 PROCinit
120 PROCass
130 menu_item%=0
140 REPEAT
150 CLS
160 PROCmenu
170 gen%=0
180 PROCclear_pop
190 PROCreset_sprite
200 PROCfeed(initfeed%)
210 !select=-1
220 REPEAT
230 SYS &2E,34+512,sprite%,saddr%,0,0
240 IF !select=-1 THEN
250 CIRCLE 4*((!(!(select+xpos%))>>>(32-logs%))),1023-4*((!(!(select+ypos%))>>>(32-logs%))),16
260 ENDIF
270 date%=(date%+var%(0)) MOD year%
280 IF var%(2)=1 THEN
290 f%=(var%(0)*var%(1)*(1+0.9*SIN(date%/(year%*2*PI))))
300 IF f%<1 f%=1
310 PROCfeed(f%)
320 ELSE
330 f%=(var%(0)*var%(1))
340 ENDIF
350 COLOUR 43
360 PRINTTAB(33,0);f%;" "TAB(33,9);g
en%;TAB(33,10);USR(pop);" "
370 PROCfeed(f%)
380 FOR i=1 TO var%(0)
390 CALL generate
400 NEXT
410 gen%+=var%(0)
420 PROCmouse
430 PROCtrace
440 ref_menu%=TRUE
450 shift%=1-9*INKEY-1
460 CASE INKEY$(0) OF
470 WHEN CHR$136:PROCset_var(-shift%)
480 WHEN CHR$137:PROCset_var(shift%)

```

```

490 WHEN CHR$138:menu_item%=(menu_item%+1) MOD vars%
500 WHEN CHR$139:menu_item%=(menu_item%+vars%-1) MOD vars%
510 OTHERWISE
520 ref_menu%=FALSE
530 ENDCASE
540 IF ref_menu% PROCmenu:FX 15
550 UNTIL INKEY-52 AND INKEY-2
560 UNTIL FALSE
570 END
580 :
590 DEF PROCtrace
600 a%=!select
610 IF a%<=was_sel% THEN
620 was_sel%=a%
630 VDU 28,32,31,39,12,12,26,24,0;0;10
23;1023;
640 ENDIF
650 IF a%<0 THEN
660 COLOUR 42
670 PRINTTAB(33,12)"E=";a%!*energy%;"
"
680 PRINTTAB(33,13)"C=";a%!*count%;" "
690 FOR i%=0 TO progsiz%-1
700 op%=(a%*(i%+genes%)) AND 7
710 par%=(a%*(i%+genes%))>>3
720 IF (a%!*p% AND (progsiz%-1))=i% C
OLOUR 63 ELSE COLOUR 7
730 PRINTTAB(33,15+i%);i%;" ";LEFT$(co
m$(op%),1)" ";
740 CASE op% OF
750 WHEN 1,7:PRINT;INT(100*par%/32);"%
"
760 WHEN 2:PRINT;par% DIV 4;" ";(i%-(p
ar% MOD 4)) AND (progsiz%-1)
770 WHEN 3:PRINT;">";par%
780 WHEN 4,5,6:PRINT;par% AND (progsiz
e%-1)
790 ENDCASE
800 NEXT
810 ENDIF
820 ENDPROC
830 :
840 DEF PROCset_var(d%)
850 var%(menu_item%)+=d%
860 IF var%(menu_item%)<min%(menu_item
%) var%(menu_item%)=min%(menu_item%)
870 IF var%(menu_item%)>max%(menu_item
%) var%(menu_item%)=max%(menu_item%)
880 ENDPROC
890 :
900 DEF PROCmenu
910 LOCAL i%
920 FOR i%=0 TO vars%-1
930 IF i%=menu_item% COLOUR 63 TINT 19
2 ELSE COLOUR 15
940 PRINTTAB(33,i%*2)var_name$(i%)
950 COLOUR 7
960 PRINTTAB(34,i%*2+1)SPC6TAB(34,i%*2
+1);
970 IF i%<2 THEN
980 PRINT;var%(i%)
990 ELSE
1000 IF var%(i%)=0 PRINT "No" ELSE PRIN
T "Yes"
1010 ENDIF
1020 NEXT
1030 IF var%(0)<1 !select=-1
1040 ENDPROC
1050 :
1060 DEF PROCmouse
1070 MOUSE mx%,my%,mb%
1080 my%=&1023-my%
1090 IF (mb% AND 1)>0 THEN
1100 PROCnew_bug(800,mx%/4,my%/4,"DESIG
NER")
1110 ENDIF
1120 IF (mb% AND 4)>0 THEN
1130 bdist%=20
1140 new%=-1
1150 a%=list!next%
1160 WHILE a%<-1
1170 IF a%!*energy%>-1 THEN
1180 dist%=(800-(((a%!*xpos%))>>>(32-logs%
))-(mx%/4)*2+(((a%!*ypos%))>>>(32-logs%)))-m
y%/4)*2)
1190 IF dist%<bdist% new%=(a%!*bdist%=dis
t%
1200 ENDIF
1210 a%=(a%!*next%
1220 ENDWHILE
1230 IF new%<<!select !select=new%
1240 ENDIF
1250 ENDPROC
1260 :
1270 DEF PROCfeed(A%)
1280 CALL feed
1290 ENDPROC
1300 :
1310 DEF PROCclear_pop
1320 ifree=w%
1330 list!next%=-1
1340 FOR i%=0 TO bugs%-1
1350 a%=(w%!*sizeof%*i%
1360 IF i%<bugs%-1 a%!*next%=(a%!*sizeof%
ELSE a%!*next%=-1
1370 NEXT
1380 FOR i%=1 TO 50
1390 PROCnew_bug(800,FNrnd(side%),FNrnd
(side%),"RANDOM")
1400 NEXT
1410 ENDPROC
1420 :
1430 DEF PROCnew_bug(e%,x%,y%,prog%)
1440 LOCAL a%,i%
1450 IF ifree<-1 THEN
1460 a%=-ifree
1470 ifree=a%!*next%

```




```

1480 a%next%list:next%
1490 list:next%a%
1500 aa%a%genes%
1510 a%energy%a%
1520 a%lxpos%<<(32-logs%)
1530 a%lxpos%<<(32-logs%)
1540 a%7pc%0
1550 a%7dir%FNrnd(4)
1560 a%7count%0
1570 FOR k%0 TO progsiz%1
1580 aa%7%FNopcode("JUMP")+(0<<3)
1590 NEXT
1600 CASE prog$ OF
1610 WHEN "RANDOM":
1620 FOR k%0 TO progsiz%1
1630 k%7aa%FNrnd(256)
1640 NEXT
1650 REPEAT
1660 a%7col%FNrnd(128)
1670 UNTIL a%7col%<foodbyte%
1680 WHEN "DESIGNER":
1690 aa%70%FNopcode("MOVE")+(31<<3)
1700 aa%71%FNopcode("SEE")+(0<<3)
1710 aa%72%FNopcode("BREED")+(28<<3)
1720 aa%73%FNopcode("TURN")+(10<<3)
1730 a%7col%255
1740 OTHERWISE
1750 ERROR 0,"No such bug type as """,p
rog$,"""
1760 ENDCASE
1770 ENDIF
1780 ENDP
1790 :
1800 DEF FNopcode(o$)
1810 LOCAL i%
1820 i%=-1
1830 REPEAT
1840 i%+1
1850 UNTIL i%<commands%-1 OR com$(i%)=o
$
1860 IF com$(i%)=o$ THEN i%
1870 ERROR 17,"Unknown command: "+o$
1880 :
1890 DEF PROCinit
1900 year%=2000
1910 initfeed%=3000
1920 date%=0
1930 commands%=8
1940 DIM com$(commands%)
1950 com$()="X","TURN","LOOP","BREED","
ENERGY","SEE","JUMP","MOVE"
1960 bugs%=4096
1970 log2g=3
1980 progsiz%=1<log2g
1990 energy%=0
2000 xpos% =4
2010 ypos% =8
2020 genes% =12
2030 needed%genes%+progsiz%
2040 next% =needed%+0
2050 pc% =needed%+4
2060 col% =needed%+5
2070 count% =needed%+6
2080 dir% =needed%+7
2090 sizeof%=32
2100 food%=300
2110 maxen%=2048
2120 side%=256
2130 logs%FNlog2(side%)
2140 en%<100+side%*2
2150 DIM sprite$ s%
2160 PROCreset_sprite
2170 SYS &2E,24+256,sprite%,"bugs" TO ,
saddr%
2180 adata%<saddr%+saddr%{32
2190 was_sel%=-1
2200 vars%=3
2210 DIM var_type%(vars%-1),var_name$(v
ars%-1)
2220 DIM min%(vars%-1),max%(vars%-1)
2230 DIM var$(vars%-1)
2240 var_name$()="Update","Food","Seaso
n"
2250 min%()=1,1,0
2260 max%()=30,100,1
2270 var%()=4,6,0
2280 ENDP
2290 :
2300 DEF PROCreset_sprite
2310 !sprite%<as%
2320 sprite%{4=0
2330 sprite%{8=16
2340 sprite%{12=16
2350 SYS &2E,15+256,sprite%,"bugs",0,si
de%,side%,13
2360 ENDP
2370 :
2380 DEF PROCass
2390 DIM code% <1000+(bugs%*sizeof%)
2400 foodbyte%<11
2410 sp=13:link=14:pc=15
2420 FOR pass%=0 TO 2 STEP 2
2430 P%code%
2440 [OPT pass%
2450 select EQUOD -1
2460 free EQUOD 0
2470 list EQUOD STRING$(next%+4,"
")
2480 .base EQUOD sdata%
2490 .feed
2500 STMFDP (sp), (r0-r12,link)
2510 LDR r8,seed
2520 LDR r9,eor
2530 MOV r10,r0
2540 LDR r11,base
2550 MOV r4,foodbyte%
2560 :
2570 .feedloop
2580 FNrand(3,logs%)
2590 FNrand(0,logs%)
2600 ADD r1,r11,r0,LSL #logs%
2610 STRB r4,[r1,r3]
2620 SUBS r10,r10,#1
2630 BNE feedloop
2640 STR r8,seed
2650 LDMFDP (sp), (r0-r12,pc)
2660 :
2670 .generate
2680 STMFDP (sp), (r0-r12,link)
2690 ADR r12,list
2700 LDR r11,base
2710 LDR r8,seed
2720 LDR r9,eor
2730 :
2740 .bugloop
2750 MOV r10,r12
2760 :
2770 .bugloopb
2780 LDR r12,[r10,#next%]
2790 CMP r12,#0
2800 STRLT r8,seed
2810 LDMLTDP (sp), (r0-r12,pc)
2820 LDMIA r12,(r5,r6,r7)
2830 ORR r0,r7,r6,LSR #logs%
2840 MOV r1,#0
2850 STRB r1,[r11,r0,LSR #(32-2*logs
%)]
2860 ADD r3,r12,#genes%
2870 LDR r4,[r12,#pc%]
2880 AND r0,r4,#progsiz%-1
2890 LDRB r0,[r3,r0]
2900 MOV r1,r0,ASR #3
2910 AND r0,r0,#7
2920 ADD pc,pc,r0,LSL #2
2930 EQUOS "Fill"
2940 B misc
2950 B turn
2960 B loop
2970 B breed
2980 B energy
2990 B see
3000 B jump
3010 :
3020 .move
3030 FNrand(0,5)
3040 CMP r0,r1
3050 BGT nextinst
3060 SUB r5,r5,#10
3070 TST r4,#(10<<24)
3080 MOVEQ r1,#1<<(32-logs%)
3090 MOVNE r1,#&FF<<(32-logs%)
3100 TST r4,#(10<<24)
3110 ADDEQ r7,r7,r1
3120 ADDENE r6,r6,r1
3130 B nextinst
3140 :
3150 .turn
3160 CMP r0,r1
3170 BGT nextinst
3180 MOV r2,r4,LSR #24
3190 FNrand(0,1)
3200 ADDEQ r2,r2,#1
3210 ADDENE r2,r2,#3
3220 AND r2,r2,#3
3230 STRB r2,[r12,#dir%]
3240 B nextinst
3250 :
3260 .loop
3270 MOV r0,r4,LSL #8
3280 MOV r0,r0,LSR #24
3290 MOVEQ r0,r1,LSR #2
3300 STREQB r0,[r12,#count%]
3310 BEQ loopback
3320 SUBS r0,r0,#1
3330 STRB r0,[r12,#count%]
3340 BEQ nextinst
3350 :
3360 .loopback
3370 AND r0,r1,#3
3380 SUB r4,r4,r0
3390 B didjump
3400 :
3410 .breed
3420 CMP r5,r1,LSL #6
3430 BLT nextinst
3440 LDR r3,free
3450 CMP r3,#0
3460 BLT nextinst ; no slots
3470 LDR r0,[r3,#next%]
3480 STR r0,free ; remove s
lot from free list
3490 LDR r0,[r12,#next%]
3500 STR r0,[r3,#next%]
3510 STR r3,[r12,#next%] ; patch in
after parent
3520 MOV r5,r5,ASR #1
3530 STR r5,[r12,#energy%]
3540 LDMIA r12,(r0-r2,r14)
3550 STMIA r3,(r0-r2,r14)
3560 LDR r14,[r12,#16]
3570 STR r14,[r3,#16]
3580 FNrand(1,2)
3590 AND r2,r4,&FF00
3600 ORR r0,r2,r1,LSL #24
3610 STR r0,[r3,#pc%]
3620 :
3630 .mutate
3640 FNrand(0,3)
3650 BNE nextinst
3660 MOV r0,r2,LSR #8
3670 ADD r0,r0,#7
3680 CMP r0,#foodbyte%
3690 ADDEQ r0,r0,#1
3700 STRB r0,[r3,#col%]
3710 FNrand(0,log2g)
3720 ADD r0,r0,r3
3730 FNrand(1,8)
3740 STRB r1,[r0,#genes%]
3750 B mutate
3760 :
3770 .energy
3780 CMP r5,#256
3790 BGT nextinst
3800 :
3810 .jump
3820 B didjump
3830 :
3840 .see
3850 TST r4,#(10<<24)
3860 MOVEQ r3,#1<<(32-logs%)
3870 MOVNE r3,&FF<<(32-logs%)
3880 TST r4,#(10<<24)
3890 BEQ see3
3900 :
3910 .see2
3920 ADD r2,r11,r7,LSR #(32-2*logs%)
3930 MOV r0,r6
3940 :
3950 FOR it%=1 TO 10
3960 [OPT pass%
3970 ADD r0,r0,r3
3980 LDRB r14,[r2,r0,LSR #(32-logs%)
]
3990 CMP r14,#foodbyte%
4000 BEQ seefood
4010 :
4020 NEXT it%
4030 [OPT pass%
4040 B nextinst
4050 :
4060 .see3
4070 ADD r2,r11,r6,LSR #(32-logs%)
4080 MOV r0,r7
4090 :
4100 FOR it%=1 TO 10
4110 [OPT pass%
4120 ADD r0,r0,r3
4130 LDRB r14,[r2,r0,LSR #(32-2*logs
%)]
4140 CMP r14,#foodbyte%
4150 BEQ seefood
4160 :
4170 NEXT it%
4180 [OPT pass%
4190 B nextinst
4200 :
4210 .seefood
4220 MOV r4,r1
4230 B didjump
4240 :
4250 .misc
4260 :
4270 .nextinst
4280 ADD r4,r4,#1
4290 :
4300 didjump
4310 STRB r4,[r12,#pc%]
4320 ORR r0,r7,r6,LSR #logs%
4330 LDRB r1,[r11,r0,LSR #(32-2*logs
%)]
4340 CMP r5,r5,#food%
4350 ADDEQ r5,r5,#maxen%
4360 CMP r5,#maxen%
4370 MOVGT r5,#maxen%
4380 SUBS r5,r5,#1
4390 STMIA r12,(r5,r6,r7)
4400 LDRPLB r1,[r12,#col%]
4410 STRPLB r1,[r11,r0,LSR #(32-2*logs
%)]
4420 BPL bugloop
4430 LDR r0,select
4440 CMP r0,r12
4450 MVNEQ r0,r0,#0
4460 STREQ r0,select
4470 LDR r0,[r12,#next%]
4480 STR r0,[r10,#next%] ; patch ou
t dead one
4490 LDR r0,free
4500 STR r0,[r12,#next%]
4510 STR r12,free
4520 B bugloopb
4530 :
4540 .brnd
STMFDP (sp), (r1-r12,link
)
4550 LDR r8,seed
4560 LDR r9,eor
4570 BL rand
4580 STR r8,seed
4590 LDMFDP (sp), (r1-r12,pc)
4600 :
4610 .rand
4620 MOV r0,#1
4630 MOV r0,r0,LSL r2
4640 SUB r0,r0,#1
4650 :
4660 .randloop
4670 MOV r8,r8,LSL #1
4680 EORCS r8,r8,r1
4690 SUBS r2,r2,r1
4700 BNE randloop
4710 AND r0,r8,r0
4720 MOV pc,link
4730 :
4740 .eor
EQUOD &1D872B41
4750 .seed
EQUOD RND
4760 .pcp
STMFDP (sp), (r1,link)
4770 ADR r1,list
4780 MOV r0,#0
4790 :
4800 .pop2
LDR r1,[r1,#next%]
4810 CMP r1,#0
4820 ADDEGT r0,r0,#1
4830 BGT pop2
4840 LDMFDP (sp), (r1,pc)
4850 :
4860 WHILE (P% AND 15)>0
4870 P%+=4
4880 ENDDWHILE
4890 wk%=P%
4900 NEXT pass%
4910 ENDP
4920 :
4930 DEF FNrand(reg,bit%)
4940 FOR r%=1 TO bit%
4950 [OPT pass%
4960 MOV r8,r8,LSL #1
4970 EORCS r8,r8,r9
4980 :
4990 NEXT r%
5000 [OPT pass%
5010 ANDS reg,r8,#((1<<bit%)-1)
5020 :
5030 =0
5040 :
5050 DEF FNlog2(n%)
5060 LOCAL l%
5070 l%=-1
5080 WHILE n%>0
5090 l%+1
5100 n%<n%>>1
5110 ENDDWHILE
5120 =l%
5130 :
5140 DEF FNrnd(n%)
5150 C%<FNlog2(n%)
5160 =USR(brnd)

```

Listing 12

```

10 REM >SpikesARC1 (Info12)
20 MODE 0:OFF:FOR I=1 TO 8:SYS 6,112,
I:CLS:NEXT:FOR N=10 TO 1 STEP -1:FOR I=1
TO 8:SYS 6,112,I:Z=4*N:FOR Y=16*I-128 T
O 1152 STEP 128:FOR X=16*I-128 TO 1408 S
TEP 128:GX=(8-N)*(X-640)/30:GY=(8-N)*(Y
-512)/30:GOLO 0:CIRCLE FILL X:GX,Y:GY,Z:0
COL 1:CIRCLE X:GX,Y:GY,Z:NEXT:NEXT:NEXT:
NEXT:REPEAT:FOR I=1 TO 8:WAIT:SYS 6,113,
I:NEXT:UNTIL 0

```

ARM PROGRAMMING

Listing 1

```

10 REM >ARM1 (Armprog1)
20 REM By Dave Lawrence
30 REM For 32 bit machines
40 REM (C) BAU March 1992
50 :
60 DIM code 100
70 link=14
80 pc=15
90 FOR pass=0 TO 2 STEP 2
100 P%code
110 [OPT pass
120 .addsub
130 MOV R0,#5
140 MOV R1,#9
150 ADD R2,R0,R1
160 ADD R0,R2,#7
170 MOV R1,#3
180 SUB R0,R0,R1
190 \ SUB R0,R0,#1
200 rab r0,r0,#30
210 MOV pc,link
220 ]NEXT
230 PRINT "Press SPACE to run code";
240 IF GET
250 PRINT "R0=";USR(addsub)

```

Listing 2

```

10 REM >ARM2 (Armprog2)
20 REM By Dave Lawrence
30 REM For 32 bit machines
40 REM (C) BAU March 1992
50 :
60 DIM code 100
70 link=14
80 pc=15
90 FOR pass=0 TO 2 STEP 2
100 P%code
110 [OPT pass
120 .mul
130 MOV R1,#5
140 MOV R2,#9
150 MUL R0,R1,R2
160 MOV R1,#2
170 MOV R2,#10
180 MLA R0,R1,R0,R2
190 MOV pc,link
200 :
210 ]NEXT
220 PRINT "Press SPACE to run code";
230 IFGET
240 PRINT "R0=";USR(mul)

```


PRINTERS

Listing 1

```
10 REM ESC/P2 Printer dump (Esc1)
20 REM by Malcom Brown
30 REM for all machines with ESC/P2 p
rinters
40 REM (C) BAU Mar 92
50 :
60 MODE 0
70 VDU 2
80 :
90 REM -- Reset printer
100 VDU 1,27,1,64
110 :
120 REM -- Select raster graphics mode
130 VDU 1,27,1,40,1,71,1,1,1,0,1,1
140 :
150 REM -- Set vert & horiz resolution
to 3600/20 dpi
160 V=20:H=20
170 :
```

```
180 REM -- Set vertical dot count to 1
190 N1=1
200 :
210 REM -- Set horizontal dot count to
650
220 N2=0:N3=5
230 :
240 REM -- Set movement unit to 20/360
0 inch
250 VDU 1,27,1,40,1,85,1,1,1,0,1,20
260 :
270 REM -- Load screen image
280 *Load Screen 3000
290 :
300 FOR Y%=1023 TO 0 STEP -1
310 :
320 REM -- Output one line
330 PROCLINE(Y%)
340 :
350 REM -- Move down one movement unit
360 VDU 1,27,1,40,1,118,1,2,1,0,1,1,1,
0
```

```
370 NEXT Y%
380 VDU 3:END
390 :
400 DEF PROCLine(Y%)
410 REM -- Print raster graphics
420 VDU 1,27,1,46,1,0,1,V,1,H,1,N1,1,N
2,1,N3
430 FOR X%=0 TO 1279 STEP 8
440 :
450 REM -- Output one byte
460 VDU 1,FNByte(X%,Y%)
470 NEXT X%
480 :
490 REM -- Return to start of line
500 VDU 1,13
510 ENDPROC
520 :
530 DEF FNByte(X%,Y%)
540 D%=0
550 FOR N%=0 TO 7
560 :
570 REM -- Gather screen data for sing
le dot
```

```
580 D%=D%+2*N%*POINT(X%+7-N%,Y%)
590 NEXT N%
600 =D%
```

Listing 2

```
10 REM Set character size (Esc2)
20 REM by Malcom Brown
30 REM for all machine with ESC/P2 pr
inters
40 REM (c) BAU Mar 92
50 :
60 MODE 3
70 VDU 2
80 FOR P%=8 TO 32 STEP 2
90 REM -- SET POINT SIZE
100 VDU1,27,1,88,1,1,1,2*P%,1,0
110 REM -- PRINT CHARACTERS
120 PRINT"aa";
130 NEXT
140 VDU 3
```

LIQUID

Listing 1

```
10 REM >Liquid (Liquid1)
20 REM by Mark A.Sidey
30 REM 32-bit machines only
40 REM (c) BAU Mar 92
50 :
60 ON ERROR PROCerror:PROCend:END
70 :
80 REPEAT
90 PROCset_variables
100 PROCassemble
110 REPEAT
120 PROCmenu
130 PROCset_up_screen
140 PROCset_flags
150 REPEAT
160 PROCmouse
170 PROCset_registers
180 CALL liquid%
190 UNTIL INKEY(-3)
200 REPEAT UNTIL NOT INKEY(-3)
210 UNTIL FALSE
220 END
230 :
240 DEF PROCmenu
250 MODEB13
260 OFF
270 COLOUR %111100 TINT %1000000
280 PRINT"Liquid Flow simulator by M.S
idey"
290 PRINT"-----"
300 PRINT"Select simulation type:"
310 COLOUR %111000 TINT %11000000
320 PRINT"1: Single liquid, flowing
down."
330 PRINT"2: Two mixed liquids, flowi
ng down."
340 PRINT"3: Two separate liquids, fl
owing down."
350 PRINT"4: Two liquids, one down, o
ne up."
360 *FX21
370 REPEAT
380 AS=GET$
390 UNTIL AS<="1" AND AS<="4"
400 type=VAL(AS)
410 IF type=4 mirror%=TRUE ELSE mirro
r%=FALSE
420 ENDPROC
430 :
440 DEF PROCset_variables
450 DIM input% 100
460 DIM output% 100
470 :input%=149
480 :input%+4=-1
490 SYS "OS_ReadVduVariables",input%,o
utput%
500 start_screen_address%=!output%
510 number_of_drops%=800
520 liquid1_colour%=%11001111
530 liquid2_colour%=%00010111
540 DIM liquid% 1000,position% 4*numbe
r_of_drops%,flag% number_of_drops%
550 ENDPROC
560 :
570 DEF PROCset_registers
580 B=number_of_drops%
590 C=position%
600 D=flag%
```

```
610 F%=start_screen_address%+320*1+160
620 F%=start_screen_address%+320*254+1
630 ENDPROC
640 :
650 DEF PROCset_flags
660 FOR a%=flag% TO flag%+number_of_dr
ops%
670 CASE type% OF
680 WHEN 1
690 ?a%=%001
700 WHEN 2
710 IF a% MOD 2=1 ?a%=%001 ELSE ?a%=%0
11
720 WHEN 3
730 IF (a%-flag%)<(number_of_drops% DI
V 2) ?a%=%001 ELSE ?a%=%011
740 WHEN 4
750 IF a% MOD 2=1 ?a%=%001 ELSE ?a%=%1
11
760 ENDCASE
770 NEXT
780 ENDPROC
790 :
800 DEF PROCassemble
810 temporary=0
820 off_set=1
830 position_pointers=2
840 flag_pointers=3
850 top_position=4
860 bottom_position=5
870 flags=6
880 liquid_colour=7
890 black=8
900 position=9
910 left=10
920 heading=11
930 right=12
940 :
950 FOR pass%=0 TO 2 STEP 2
960 P%=liquid%
970 [OPT pass%
980 MOV black,%0
990 :
1000 .loop
1010 LDRB flags,[flag_pointer,off_set]
1020 ANDS temporary,flags,#1
1030 BNE start_drop
1040 MOV temporary,flags,LSR#1
1050 ANDS temporary,temporary,#1
1060 MOVEQ liquid_colour,%liquid1_colou
r%
1070 MOVNE liquid_colour,%liquid2_colou
r%
1080 LDR position,[position_pointer,off
_set,LSL#2]
1090 STRB black,[position,%0]
1100 MOV temporary,flags,LSR#2
1110 ANDS temporary,temporary,#1
1120 CMP temporary,%0
1130 CMPEQ position,bottom_position
1140 BEQ finish_drop
1150 CMP temporary,#1
1160 CMPEQ position,top_position
1170 BEQ finish_drop
1180 CMP temporary,#1
1190 LDRNEB heading,[position,%320]
1200 LDREQB heading,[position,%-320]
1210 CMP heading,black
1220 BNE sides
1230 CMP temporary,#1
1240 ADDNE position,position,%320
```

```
1250 SUBEQ position,position,%320
1260 B output
1270 :
1280 .sides
1290 LDRB left,[position,%-1]
1300 LDRB right,[position,%1]
1310 CMP left,black
1320 BNE look_right
1330 CMP right,black
1340 BEQ both
1350 SUB position,position,#1
1360 B output
1370 :
1380 .look_right
1390 CMP right,black
1400 BNE stuck
1410 ADD position,position,#1
1420 B output
1430 :
1440 .both
1450 CMP heading,%255
1460 BEQ sort
1470 SWI "OS_ReadMonotonicTime"
1480 ANDS temporary,temporary,#1
1490 ADDEQ position,position,#1
1500 SUBNE position,position,#1
1510 B output
1520 :
1530 .sort
1540 MOV temporary,flags,LSR#1
1550 ANDS temporary,temporary,#1
1560 ADDEQ position,position,#1
1570 SUBNE position,position,#1
1580 B output
1590 :
1600 .stuck
1610 MOV temporary,flags,LSR#2
1620 ANDS temporary,temporary,#1
1630 LDREQB heading,[position,%-320]
1640 LDRNEB heading,[position,%320]
1650 CMP heading,black
1660 BNE output
1670 CMP temporary,#1
1680 SUBNE position,position,%320
1690 ADDEQ position,position,%320
1700 :
1710 .output
1720 STRB liquid_colour,[position,%0]
1730 STR position,[position_pointer,off
_set,LSL#2]
1740 :
1750 .next
1760 SUBS off_set,off_set,#1
1770 BGT loop
1780 MOV PC,R14
1790 :
1800 .start_drop
1810 LDRB temporary,[top_position,%0]
1820 CMP temporary,black
1830 BNE next
1840 MOV temporary,flags,LSR#2
1850 ANDS temporary,temporary,#1
1860 MOVNEQ position,top_position
1870 MOVNE position,bottom_position
1880 AND flags,flags,%110
1890 STRB flags,[flag_pointer,off_set]
1900 B output
1910 :
1920 .finish_drop
1930 ORR flags,flags,%001
1940 STRB flags,[flag_pointer,off_set]
1950 B next
```

```
1960 ]
1970 NEXT
1980 ENDPROC
1990 :
2000 DEF PROCset_up_screen
2010 MODEB13
2020 OFF
2030 GCOL %001011 TINT 0
2040 RECTANGLE 0,0,1279,1023
2050 RECTANGLE 4,4,1268,1012
2060 IF mirror% VDU19,0,24,0,0,&50
2070 GCOL 0 TINT 0
2080 POINT 640,1016
2090 POINT 640,4
2100 VDU 24,8;8;1271;1012;
2110 *POINTER 1
2120 MOUSE COLOUR1,100,255,0
2130 MOUSE COLOUR2,0,255,0
2140 MOUSE STEP 1
2150 REPEAT
2160 PROCmouse
2170 IF INKEY(-68) GCOL %001011 TINT %0
1000000:RECTANGLE FILL%,0,1279,1023
2180 UNTIL INKEY(-3)
2190 REPEAT UNTIL NOT INKEY(-3)
2200 ENDPROC
2210 :
2220 DEF PROCmouse
2230 IF INKEY(-50) THEN
2240 MOUSE STEP 0,1
2250 ELSE
2260 IF INKEY(-49) THEN
2270 MOUSE STEP 1,0
2280 ELSE
2290 MOUSE STEP 1
2300 ENDF
2310 ENDF
2320 MOUSE x%,y%,b%
2330 IF INKEY(-12) THEN
2340 GCOL 0 TINT 0:MOUSE COLOUR 2,0,0,0
2350 ELSE
2360 IF INKEY(-97) THEN
2370 GCOL 63 TINT 192:MOUSE COLOUR 2,25
5,255,255
2380 ELSE
2390 GCOL %001011 TINT %01000000:MOUSE
COLOUR 2,0,255,0
2400 ENDF
2410 ENDF
2420 :
2430 IF INKEY(-114) mirror%=FALSE:VDU19
,0,24,0,0,0
2440 IF INKEY(-115) mirror%=TRUE:VDU19,
0,24,&00,&00,&50
2450 IF (b% AND 4)=4 CIRCLE FILL x%,y%,8
:IF mirror% CIRCLE FILL%,(512-y%)+512,8
2460 IF (b% AND 2)=2 POINT x%,y%:IF mirr
or% POINT x%,(512-y%)+512
2470 ENDPROC
2480 :
2490 DEF PROCerror
2500 IF ERR<>17 MODE0:PRINT"REPORT$;" a
t line "":EOL:END
2510 ENDPROC
2520 :
2530 DEF PROCend
2540 SYS"OS_Byte",161,194 TO dummy,dum
my,mouse_step%
2550 mouse_step%=mouse_step% AND %111
2560 IF mouse_step%=0 mouse_step%=1
2570 MOUSE STEP mouse_step%
2580 ENDPROC
```


3 1/2" DISKS

TYPE	QTY	25	50	100
BENCHMARK DS/DD		£18.00	£31.00	£45.00
UNBRANDED DS/DD		£12.80	£21.00	£39.00
EX WESTERN DIGITAL VGA DRIVERS (NEW BUT FORMATTED AND LABELLED). DS/DD		SOLD OUT £25.00 PER 100		
BENCHMARK DS/HD		£33.60	£61.00	£67.00
UNBRANDED DS/HD		£25.00	£36.00	£59.00
EX WESTERN DIGITAL VGA DRIVERS (NEW BUT FORMATTED AND LABELLED). DS/HD		SOLD OUT £45.00 PER 100		

ALL DISKS 100% CERTIFIED ERROR FREE. 3 1/2" INC. LABELS. 5 1/4" INC. ENVELOPE AND LABEL SET.

DISK STORAGE BOXES

3 1/2" 10 CAPACITY QTY 5	£4.50
3 1/2" 50 CAPACITY LOCKABLE	£3.70
3 1/2" 100 CAPACITY LOCKABLE	£4.70
3 1/2" 240 CAPACITY STACKABLE	£15.00
5 1/4" 10 CAPACITY QTY 5	£4.99
5 1/4" 50 CAPACITY LOCKABLE	£3.70
5 1/4" 100 CAPACITY LOCKABLE	£4.70

PRICES ONLY IF BOUGHT WITH DISKS

5 1/4" DISKS

TYPE	QTY	25	50	100
BENCHMARK DS/DD		£11.00	£18.00	£28.00
UNBRANDED DS/DD		£9.50	£16.00	£24.00
OVERLABEL DS/DD INC. TYVEX ENVELOPE		£20.00 PER 100		
BENCHMARK DS/HD		£18.00	£31.50	£52.50
UNBRANDED DS/HD		£14.00	£27.00	£48.00
OVERLABEL DS/HD INC. TYVEX ENVELOPE		SOLD OUT £22.00 PER 100		

ACCESSORIES

IBM PRINTER CABLE 1.8 MTR	£4.90
(ALSO FOR ATARI AND AMIGA)	
25 PIN M-M AND M-F 1.8 MTR	£4.90
36 PIN CENTRONIC M-M 1.8 MTR	£4.90
RIGID DOUBLE SIDED MOUSE MAT	£4.50



ALL PRICES INCLUDE VAT & P&P. UK ORDERS ONLY

Cheques and Postal Orders to



24 HOUR ORDERLINE 0597 851 784

Manor Court Supplies Ltd

Telephone: 0597 851 792 Fax No: 0597 851 416

Dept AU3, Glen Celyn House, Penybont, Llandrindod Wells, Powys, LD1 5SY

EDUCATION AND GOVERNMENT ORDERS WELCOME

FREE demo disc

ARCHWAY 2

Available NOW

"ARCHWAY is one of the most impressive and best value for money products that I have yet seen for the Archimedes. Anyone who wishes to write RISC applications in BASIC would have to be quite insane NOT to enlist the aid of this remarkable package."

A & B Computing, February 1990

"You get an excellent piece of software which will make the mountain of programming needed to operate the WIMP environment into a molehill...you can create a complex WIMP environment very quickly...I have had no end of use out of this easy-to-use package."

Archive, July 1989

"I am sure ARCHWAY will cut out a lot of the work of writing simple applications for many people...I think this could be a very good place to start."

BBC Acorn User, April 1991

"I'm extremely impressed with ARCHWAY 2. It's a very ambitious product and one that now provides the many budding Archimedes developers with a facility that will enable them to get their ideas off the drawing board before they evaporate."

RISC User, April 1991

ARCHWAY 2 lets YOU unleash the huge program power of RISC OS and the ARM easily and quickly. Build powerful multi-tasking, multi-window applications with pop-up menus, icons, mouse control, etc. of professional quality. Programs are RISC OS compliant.

If you are a little familiar with BBC BASIC then you can create applications using ARCHWAY 2. We have optimised the facilities to let you achieve powerful results with a minimum of programming.

The price is £86.91 exc VAT but with p/p (£102.12 inc VAT at 17.5%). VISA & ACCESS are welcome. Please add £5.00 for postage in Europe or world-wide surface mail & £20.00 for world airmail. For schools a site licence is included in the price. Currently at version 2.13.

Detailed ARCHWAY leaflet and demo disc FREE on request.

Archway NEWS Archway NEWS Archway NEWS

We have a new release of ARCHWAY in test at present. It is fully RISC OS 2/3 compatible and automatically adapts to the version you are using. There is built in support for slider icons, up to 3 panes in a window and browser windows for scrolling lists of data. Major areas of the run-time have been ARM coded to make your programs run even faster. Existing users can normally update their applications just by using the new run-time.

From 1.11.91 ARCHWAY 2 is being sold with a FREE upgrade voucher for the new version. Please note that you cannot combine our earlier special offer and this voucher.

The first of our new range of ARCHWAY products are on release this month. They use the new ARCHWAY run-time and so are intelligently RISC OS 2/3 compatible. Please send for full details.

SIMTRON Programs to help you

4 Clarence Drive, East Grinstead, West Sussex RH19 4RZ Telephone (0342) 328188

GENEALOGY

(See review in Feb '87 and Aug '89)

FAMILY HISTORY SYSTEM The most popular program ever written for us. Enables you to produce a full family tree and many other genealogical listings £20.95
BBC/Master/Compact version £20.95 - Archimedes version £25.95

PAYROLL

EXTENDED PAYROLL Now in its eighth year. The only BBC program for wage, tax and National Insurance for up to 400 employees covering 12 months. Four weekly and Monthly pay whether contracted or casual. Extensive range of data per employee in two parts. Extensive range of employee information. Extended range of deductions acceptable. Extended range of pension deductions, sick pay, SSP SMP. Extended range of pre and post tax adjustments and even no pay. Three different types of payslip printout and an optional coin analysis. An annual contract keep you up to date with the budget changes. Send for demo disc £52.50

BOOKKEEPING

(see review in March '89 Acorn User)

- CASHBOOK** Double entry bookkeeping for home or club use. All data kept in memory. Three character analysis code enables you to know where the money comes from and where it goes. 48 transactions per A4 page. Analysis summary up to 30 categories. £14.95
- CASHBOOK D** As 1) + random access giving 2000 items. CASH/BANK or VAT/BANK headings. Password control. String or numeric searches. For schools, clubs & non credit businesses. £23.95
- ACCOUNT** As 2) + Credit facility and statements. For small businesses working with credit. £35.95
- ACCOUNT-PLUS** As 3) + Invoicing. Orders. Quotations etc. Full sorting of data by 5 options. Automated statements, mailing labels. Multiple automatic nominal ledgers. For independent schools and VAT businesses who wish to cut the effort. £59.95
- TAXMAN** This new program which has been under development for three years allows you to enter all your transactions and to printout end of year results with balance sheet and even calculate tax due. The Inland Revenue love it and so do we. Results can be taken from our other accounting programs and entered into TAXMAN making a superb combination. £59.95
- Micro-Trader** is a full accountancy package with features right through to final balance sheet. Stock Control at £75.00 extra. For shops/firms, accountants wanting full accounting facilities. Payroll can be integrated. £235.00
£88.13

MAILING

218 addresses in memory or up to 1875 on random access disc. Multiple selected and repeat labels, mail merge, full sorts. Ideal for subscription lists, promotions, any kind of mailing. £14.95
£35.95

Ask for detailed brochure for more software and other items.

Demo discs available for £2.50 each, Micro-Trader £25. Prices include VAT add 81p p/p PLEASE NOTE OUR MOVE & CHANGE OF ADDRESS FROM CORNWALL

Micro-Aid
SOFTWARE FOR THE BBC MICRO COMPUTER

(FAX AVAILABLE)

Kildonan Courtyard, Barrhill, S. Ayrshire
Scotland. KA26 0PS. Tel: 0465 82288

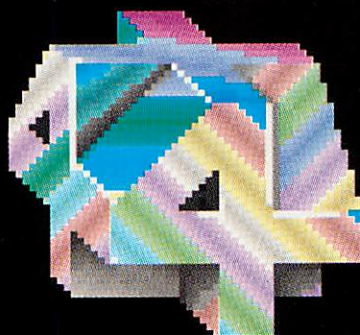


THE FOURTH DIMENSION

Software Catalogue



THE Archimedes Games Specialists



Grievous Bodily 'ARM



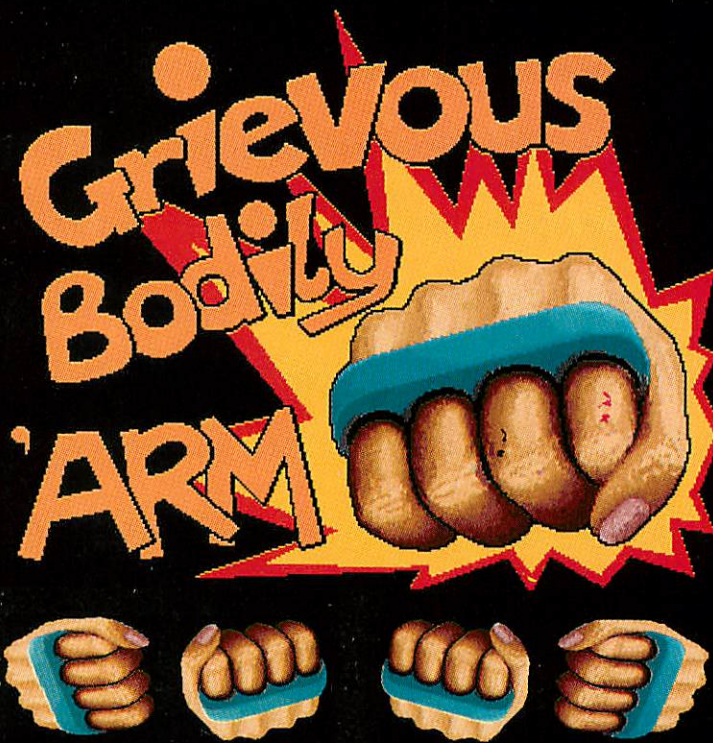
"A Brutal Uninhibited Arcade Beat'em Up!"

The Plot

An evil scientist discovers a cheap and easy way to manufacture vast quantities of illegal narcotics. His intentions - to turn cities full of people into junkies, all dependent on his supplies.

Mass addiction spreads throughout the city within days - like a deadly plague. Gang violence, looting, mugging - people will do anything to get their next fix, your only chance for survival is to get the crazy scientist yourself and make sure he will never be able to make any drugs again.

Punching, kicking - finding weapons along the way, you fight through hordes of junkies in streets, warehouses and sewers until you reach the mad scientist's laboratory where you must 'deal with him for good'.



The Development Team

Comprises a Software Engineer and Graphic Artist who previously worked for years in the American arcade and home console markets, writing ultra-playable games that have sold around 1 million copies worldwide. Now writing for the technically superior Acorn RISC based range of computers.

Techno Stuff

Frame Rate 50 Frames/Second
Constant

Object Code Handwritten Arm
Code and Basic

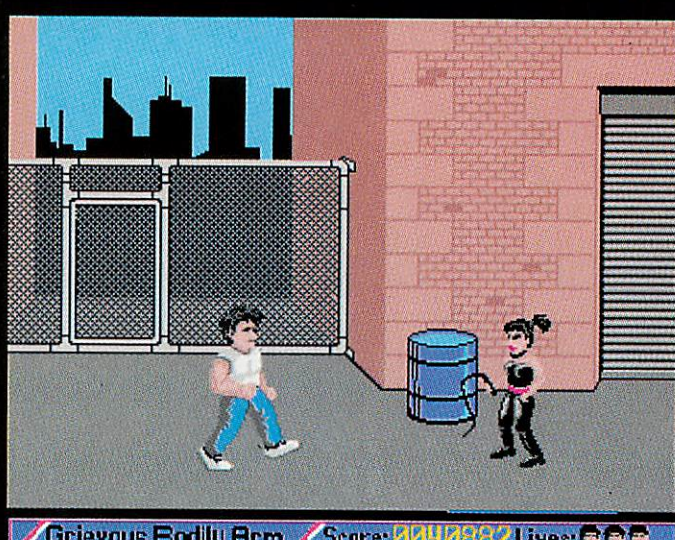
Graphics Over 1.5 Mbyte. High
Speed Custom Written
Graphics Handlers

Sound Digitally Sampled

Computer Archimedes with
1 Mbyte or more

Inputs Keyboard or Joystick

BBC A3000 & ARCHIMEDES PRICE £24.95 Release date hopefully late November '91



Saloon Cars



The Ultimate Driving "Game-ulation"!

Combining the best features of a fast and furious racing game with the realism of an accurate driving simulator. Work your way up through the leagues, buy extra features and faster cars, to become the Saloon Car Racing Driver of the Year.

Game Plot

You are an amateur racing driver just starting in the field. You race at weekends during the summer, and have a full time job at the office all week* which helps to pay some of the gargantuan bills you incur at weekends! You have recently blown your life savings on an Astra GTE and entered a season of races...

With your Astra you compete in class C against the other Astras and, if you prove yourself worthy by working your way up through the league, you may eventually manage to get sponsorship to race in class B. At this point you will need to buy a BMW M3, built to your exact specifications and the manufacturer's custom price. After a few more seasons you may even reach the exalted heights of a Cosworth Sierra...

*It is beyond the scope of this program to provide a realistic simulation of a full time office job!

Dynamics

The mathematical simulation of the dynamics of a car in motion was set up by a professional physicist. A Classical Newtonian model is used for the transmission and to model the motion of the wheels on the road in both regimes of sliding. The result of all this is a program realistic enough to allow front, rear and four wheel slides, Understeer and Oversteer and of course handbrake turns.

Graphics

The game features 256 colour, mode 13 graphics, designed by a professional artist. The view is a first person, cockpit view from which you can see the road ahead, the rear view mirror and the instruments. The main view features totally customised handwritten ARM code graphics routines which were necessary to maintain the superb frame rate and create a view previously undreamed of. The courses (Silverstone & Brands Hatch) feature bridges, stands, gravel traps, barriers, the pit lane, and even the man with the chequered flag. Of course there are many other features, but we think it's better to save most of them to be a surprise!

Technical Information

Frame Rate	Up to 25 FPS
Object Code	250k of Handwritten Arm Code
Graphics	256 colour, mode 13 graphics Handwritten, custom graphics routines
Sound	Digitally sampled sound effects (Naturally!)
Computer	Any Archimedes with 1Mbyte or more
Inputs	Mouse, Keyboard or Joystick
Serial Link	This option will be supplied on a separate disc

BBC A3000 & ARCHIMEDES PRICE £24.95

"Saloon Cars" is compatible with the BBC A3000 and ALL Archimedes computers

Reviews

"The graphics are very impressive - 256 colours with the screen updated at a very fast rate.technically Saloon Cars is a breathtaking piece of programming and a stunningly accurate simulation." The Micro User, Sep '91.

"...Saloon Cars uses real-time 3D graphics to produce a game that the Amiga can't hope to match (and so far as PCs are concerned you'd probably need either a 33MHz 386 or even a 486!)....The game features 256 colours (mode 13) and absolutely stunning animation. Make no mistake: the speed and smoothness of this game has to be seen to be believed. It's the first simulation I've seen on a computer (i.e. outside of mega-expensive arcade machines loaded with custom chips) that actually feels like you are in a car!" Syracuse, Summer '91.

Reviews

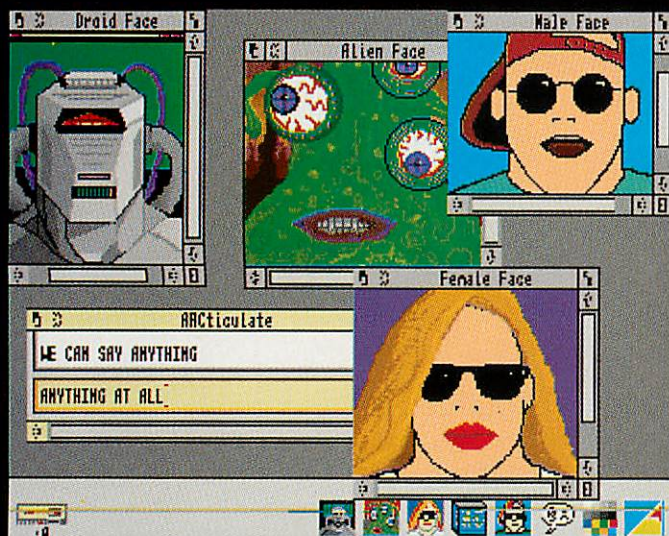
"Once you actually start racing for the first time your jaw will need chiselling off the floor - you cannot help but be astounded at the gameplay.....The cars and courses are realistic down to the millimetre (well, nearly!).....To be honest, I would not have imagined that with the amount that goes on, the display would have scrolled so smoothly. You simply need to see it to believe it!" Club A3000, Summer '91.

"For all you driving and/or racing enthusiasts this is the one you've been waiting for. It's also fine for anyone who just wants a good game." Acorn User, Oct '91.

"...if you are looking for a realistic simulation coupled with a fun arcade game and can't afford the running costs (or repairs) of a Cosworth, then Saloon Cars is a must." Micronet, July '91.



ARcticulate



"The Animated Speech Synthesizer"

This unique and revolutionary speech synthesizer actually has faces that talk to you and to each other. You can choose from 4 main faces and voices - male, female, alien or droid - thereby truly bringing your computer to life!

ARcticulate works in the desktop environment allowing full multi-tasking with word processors etc.. ARcticulate will read any documents that you have written or you can insert jokes, questions etc. etc..

You can alter the pitch, speed, volume and of course voice, during and after any sentence, thus allowing the faces to even talk to each other. The Dictionary supplied is a RISCOS application and is simplicity itself to use. It holds up to 600 words in any file and you can have as many files as you wish - ideal for specialist subjects.

Also included in the package are a selection of jokes, some amusing noises to attach to desktop events, a provisional dictionary file and a superb demonstration program showing you just how articulate ARcticulate is!

FACTFILE

- 4 animated faces able to cover all mouth positions
- 4 meticulously sampled voices which can say absolutely anything you want
- All faces and voices can be installed together
- An individual face and voice can be installed in less than 120K
- Very easy to use dictionary application with up to 600 words per file and limitless files
- Reads text files, word processor documents and can be easily used with your own programs
- Entertaining Joke program, Demo program and Funny Noises program also included

"...ARcticulate produces clearer and more natural speech than any of its rivals. It also has talking heads." Archive, Sep '91.

"...the actual quality of the speech is excellent - I have never heard computerised speech sound so real.... The male and female voices actually sound like real people....ARcticulate is a fun program, and demonstrates high quality speech on the Archimedes." Syracuse, Summer '91.

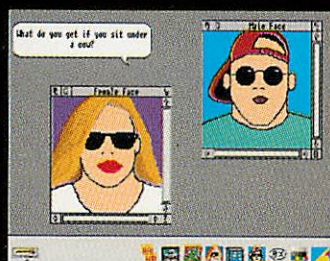
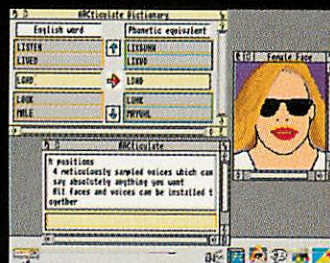
BBC A3000 & ARCHIMEDES PRICE £24.95

ARcticulate is compatible with ALL Archimedes computers

ARcticulate



The 4th Dimension



Holed Out Compendium



"An Immensely Playable Golf Game for 1-6 Players"

Includes: The Original Holed Out

This superbly enhanced version really shows the power of the Archimedes at its best. The game is completely mouse driven and features atmospheric digitised sound effects to convince you that you are really playing golf.

- 1 to 6 players. • 2 contrasting 18 hole courses.
- 4 skill levels for beginner to professional. Learn to play without worrying about the wind, bunkers or rough.
- Realistic ball flight paths. • Slice and hook capabilities.
- Variable wind on each hole - every round is unique.
- Full set of 14 clubs with accurately defined performances. You must consider your lie, the distance required, the wind conditions, the height required and the degree to which the ball will bounce and run along the ground.
- Bunkers, trees, water and variable rough.
- Constantly updated full scoreboard. • Matchplay or strokeplay options.

"I play golf and this game is the closest thing to the real game on a computer. The graphics are very good with a large scale golfer complete with bag and trolley (and a good swing!) and the sounds are very realistic." ARCHIVE, June '89.

".....a great game." The Micro User, August, '89.

& The Holed Extra Courses 1 & 2

These feature 4 extra 18 hole courses which have been meticulously created to test your golfing skills to the limit.

& The Holed Out Designer

Create your own courses with this easy to use yet highly sophisticated hole designer. Its flexibility allows you to define all aspects of the holes from their pars to the size, shape and position of the holes.

"The Holed Out Designer is very easy to use and it makes a perfect complement to the original game." The Micro User, Jan '90.

BBC A3000 & ARCHIMEDES PRICE £24.95

The Holed Out Compendium is compatible with ALL Archimedes computers



Catalysm



"A Stunningly Original and Watery Game!"

Scenario

Unable to escape the gravitational pull of a truly massive planet, the cosmic exploration ship hurtles ever nearer to the planet's surface. The moment of impact fails to happen. Horrendous creaking sounds, and the faintly audible sound of running water provide sufficient evidence to enable the ship's supervisor to eventually grasp the situation. Submerged beneath a vast and alien ocean, the *Orcna* is gradually disintegrating...

Game

Playing the part of the ship's supervisor, your task is to expel water from different sections of the ship via hydraulic pumps, to give the ship's semi-organic outer shell time to repair itself. The water enters each section through a network of pressure-relieving pipes, and must be directed towards a collecting vessel using several manipulating blocks. This must be accomplished within a time limit, before the pressure becomes too great.

The various sections of the ship contain numerous features to further complicate your task. Pressure valves, dissolving blocks and filters all affect the flow of the water. Additionally, the water's presence has disrupted the ship's computer, which is now intent on terminating your existence using the on board weapons' systems, although it is possible to acquire fire power of your own.

As the *Orcna* is an exploration ship, it contains many strange alien life forms, gathered from distant galaxies. The now chaotic computer has taken upon itself to release these creatures from their confining cells, and the aliens are rampaging freely throughout the ship. Needless to say, several of these species are particularly unpleasant. Your task is to prevent the disaster that would occur were the *Orcna* to succumb to the icy water that is flooding into the ship. Your task is to prevent a cataclysm.

Program

Catalysm is a stunningly original and unique game. As well as incorporating conventional sprite and pixel plotting techniques, a cellular automata is employed to generate realistic fluid motion. A simple set of rules is applied to each individual droplet of water, with hundreds of droplets forming a dynamic fluid which flows around the various on-screen objects. The water will adopt the shape of any container, and even exhibit tiny air bubbles. Later levels incorporate extended fluid routines to create frothing acid, and coloured liquids that mix on contact. Optimised sprite routines allow the presence of various aliens and over one hundred parabolic particles and bullets, all moving extremely smoothly at a high frame update rate.

Guiding the water through the various features and into the collecting vessel requires logical thought, coupled with arcade reflexes. Catalysm successfully combines both puzzle solving and shoot'em up elements to create an immensely playable and enjoyable game.

Technical Specifications

50 Hertz cellular automata generates realistic fluid motion.

Over 1000 individual droplets of water on screen simultaneously.

Water, sprites and over a hundred independent particles and bullets updated at 50 frames/second.

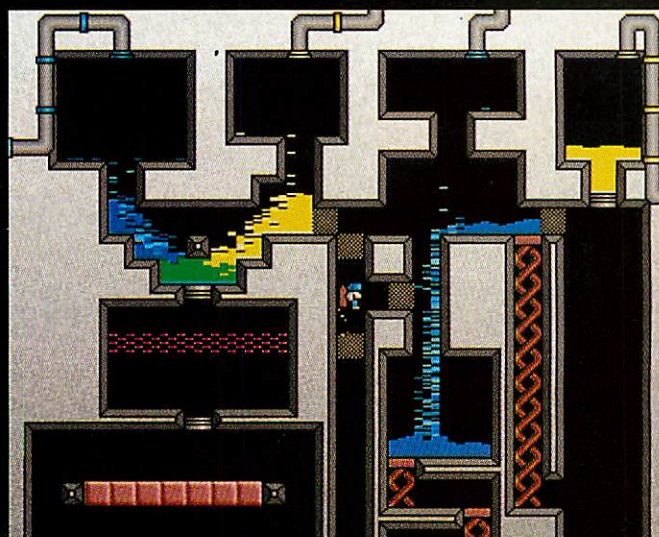
256 colour graphics, 320*640 pixel playing area with superbly smooth animation and scrolling.

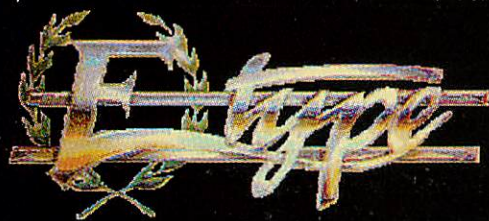
Over 500k of superb sampled music and sound effects.

40 increasingly complex and difficult levels.

Numerous features including valves, dissolving blocks, remote control doors, drip-valves, linear and parabolic guns, increasingly available fire power, various types of aliens, acid, coloured liquids, guided bullets etc...

BBC A3000 & ARCHIMEDES PRICE £24.95 Release date hopefully late November '91





"The All-Time Classic Car The All-Time Classic Game"

The "E-Type Compendium" includes: The Original E-Type

Take control of £70,000's worth of gleaming "E-Type" and head off for the drive of a lifetime. Hear the digitised roar of the 5.3 litre 12 cylinder engine as you tear along lanes, roads and motorways at speeds over 150 m.p.h.

"E-Type" takes racing simulations into the world of 32 bit RISC processing to bring you a game of a quality that is not often found even in the arcades.

If you are new to car driving you can take the very easy to drive automatic for a spin but experienced drivers can optimise performance using the faster 5 speed manual.

There are hazards galore in the 5 varied scenarios including other cars, roadworks, pedestrians, trees, rocks, bushes, oil spills and many more.

"On the Archimedes the illusion of speed is terrifyingly real and the way the landscape moves in three-dimensional perspective is a joy - a stunning experience." The Independent, Dec'89.

"This is a superb game....the tracks are fantastic." The Times Dec'89.

"No race game on any other machine looks as good." The Times Educational Supplement Dec'89.

& The E-Type Extra 100 Miles

This consists of 100 extra miles of very hilly and hazardous roads. They will test even the best drivers to the limit.

& The E-Type Designer

This highly advanced but simple to use designer allows you to design your own tracks. It is enormously flexible to produce an endless variety of tracks to challenge you and your friends.

"The perfect complement to E-Type." The Games Machine Feb'90.

BBC A3000 & ARCHIMEDES PRICE £24.95

The E-Type Compendium is compatible with ALL Archimedes computers



Boogie Buggy



"A Totally Original Game with Stunning Animation"

Boogie arrives at Dodge City to find that the Evil Monster Lord has taken control and set about converting power-ore, which is extracted from a mine in the centre of the city, into evil-ore, which he is using to transform all the good in Dodge City into evil. As the Evil Monster Lords' power increases, he proceeds to turn Dodge City into a stronghold for creatures of darkness and other evil monsters, and plots to take control of Bumper World. Boogie has not yet been influenced by the evil-ore and so it is up to him to thwart the Evil Monster Lords' plans.

To do this Boogie must travel across Dodge City counteracting the effect of the evil-ore in each zone by collecting lumps of power-ore, and returning them to the mine. Boogie must also destroy each of the Ore Conversion Plants (O.C.P.'s), before finally meeting the Evil Monster Lord in the Ore Core.

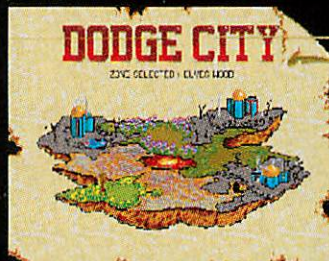
"The first thing you notice about Boogie Buggy is that the graphics are gorgeous. The game uses the border as well as the main playing area by about 40% and the effect is stunning." BBC Acorn User, Sep '91.

"Boogie Buggy sets new heights in presentation, the whole program is a feast for the eyes. Take a look at the lily pond for example, it's breathtakingly good....Boogie Buggy is totally original, packed with action, great sound, catchy music and above all incredible graphics and animation....it's brilliant." Syracuse, Summer '91.

"Coming on three discs, it's certainly a vast game and only just runs on a 1 megabyte machine....Graphics are probably the most pretty and colourful I have seen on an Archimedes, with plenty of plants, flowers and wildlife, all well-drawn in cartoon style artwork....On the whole it's a well thought out and designed game which is addictive too." Micronet, July '91.

BBC A3000 & ARCHIMEDES PRICE £24.95

Boogie Buggy is compatible with ALL Archimedes computers



Chocks Away EXTRA MISSIONS



CHOCKS AWAY

This new upgraded Mark II Chocks Away with supersmooth animation really is flight simulation the way you've always wanted it. It has everything for the beginner and the expert:

*Beautiful 256 colour graphics and 'nerve shattering' digitised sound effects

*Easy to fly, yet highly manoeuvrable bi-plane - ideal for all ages/skill levels

*Revolutionary 2 Player Option using split screen display. This allows 2 players to each fly their own planes simultaneously in practice, dogfights or missions

*Full joystick, dual joysticks, mouse and keyboard control options

*Amazing "Black Box Flight Recorder" included so that you can record your own flights and then save and replay them. 90 minutes of totally absorbing pre-recorded training flights are included with the game

*Internal/External views of your plane can be selected from front/rear/left/right

*Powerful 30mm cannon capable of very rapid fire and long range destruction

*Easy to read instrument panel and simple controls

*3 very varied immense maps to explore - approximately 18000 km² in total

*20 fascinating and varied missions of increasing complexity are included with a promotion system from Cadet right through to Marshal of the RAF

*Superb range of targets/enemies including bombers, triplanes, fighters, tanks, control towers, anti-aircraft guns, HQs, patrol boats...

CHOCKS AWAY EXTRA MISSIONS

This consists of a new manual and a disc containing an additional 26 missions (6 of which are reconnaissance missions). It is loosely based on the original Chocks Away and features an extensive range of extra features and improvements. To run it you will require the MkII version of the original Chocks Away. Extra features include:

*16 new & detailed maps based over land & sea.

*20 enemy planes and 20 enemy targets are included in each mission. Over 1000 extra targets and planes have been carefully defined.

*Considerably improved action on all missions with plenty of targets to shoot at and plenty shooting at you.

*You can view the action from any of the enemy planes or targets and your own control tower at any time even while still controlling your own plane or watching a saved flight. There is a selection of tracking cameras (with adjustable zoom lenses!) around the playing arena. In addition a phantom plane can also be selected to follow the action on any of your black box flight recordings.

*Improved enemy pilots capable of performing loops, rolls, stall turns etc.. All enemy planes are carefully modelled using the same equations controlling your own plane. This ensures both an accurate and fair simulation.

*More enemy planes and targets to shoot including: Three Engine Fighters, Enormous Cargo Planes, Airships, Barrage Balloons, Gun Boats, Oil Tankers, Trains etc..

*Six reconnaissance missions where you are required to take photos of various installations with your new on board camera.

*Improved graphics over the 16 maps including Complex Cities, Houses, Railways, Roads, Rivers, Bridges, Lampposts, Railway Stations, Oil Rigs, Piers, Beachs, etc. to mention but a few. In total over 100 different graphics have been defined.

*Serial Port Link Up option so that you can link up 2 BBC A3000 or Archimedes computers and 2 pilots can fly simultaneously in full screen mode.

*Extensive enemy flak guns and improved enemy plane guns help make the new missions both more interesting and challenging to say the least!

*Improved digitised sound effects plus, of course, all the extensive options which are available with the original Chocks Away.

WIN a Superb

"Radio-Controlled Biplane"

Successful completion of all 6 Reconnaissance Missions will allow you to enter this competition

TALLY HO GINGER!



**ARCHIMEDES
& BBC A3000**

All versions are compatible
with the BBC A3000 and
ALL Archimedes Computers

CHOCKS AWAY (Mark II Version with 1 or {split screen} 2 player options) £24.95

CHOCKS AWAY EXTRA MISSIONS (With 2 player Serial link option) £19.95

CHOCKS AWAY COMPENDIUM (Chocks Away & the Extra Missions) £39.95

CHOCKS AWAY NETWORK (Econet/Midi etc. - Ring for Availability & Price)

Chocks Away Reviews

Chocks Away Mark I Version was awarded **GAME OF THE YEAR 1990** by Acorn User, A&B Computing (now Archimedes World), Rise User & Micronet.

"Graphics in the game are superb, smooth and with plenty of ground detail.....this is a really enthralling flight simulator with plenty of variation and features to ensure longevity." Rise User, Dec '90.

"Chocks Away is a delightful game." Archive, Jan '91.

"Chocks Away is a brilliant game." BBC Acorn User, Dec '90.

"...it's a really great game. Playability 10. Value 10." The Micro User, Jan '91.

"(Chocks Away Mark II Version).. The increased speed obviously makes the game more responsive and fun to play, well and truly overtaking Interdictor II as the best Archimedes plane game." New Computer Express, Feb '91.

Extra Missions Reviews

"I reckon Chocks Away is probably still the best game available for the Archimedes/A3000." BBC Acorn User, August '91.

"How do you improve on a game that left me rushing for my Thesaurus to describe it? Well, those guys at 4th Dimension have delivered the goods once again, and have somehow managed to improve on the best flight simulation on our humble Arc." Club A3000, Summer '91.

"Chocks Away remains, above all, fun. It doesn't really sacrifice realism, but it also doesn't make controlling the aircraft so complicated that you haven't got time to enjoy the game.." Syracuse, Summer '91.

"If you haven't yet seen this game, the screenshots in the 4th Dimension's latest adverts don't do the game justice, simply rush out and buy it. Beware though, once you've played it once, you'll never have another early night." Micronet, June '91.

Enter The Realm



"A Superfast Adventure into Arcade Action"

Combining fast arcade quality action and graphics with the element of adventure and surprise. Meet strange characters, build up your weapons and eventually meet evil in mortal combat.

The Background

Travel back to Karidor, a land lost in antiquity. A land of evil, a land of good. A land where almost anything can happen and probably will. A land of magic and a land of beauty. So your quest begins.....

The land of Karidor was a quiet world much like Earth. It had mountains, it had seas. It had forests and it had deserts. Even the people were similar, but one thing was different. This was the fact that magic did exist there.

For many aeons the land was untroubled by any great power until one fateful day where everything changed and evil took control. Evil had always existed of course, but had been in balance with the good of the gods, who were neutral. That day however, the balance was tipped.

It turned out that the ancient prophecies of Karidor had proclaimed this event thousands of years ago. The prophecy stated that evil would overthrow the Realm and only one man, a knight of goodly heart and fearsome ability could reset the balance again. The knight was named Kharas.

Enter the Realm challenges you to lead Kharas in his conquest against evil. On the way, dangers will befall you and surprises will await you...

The Game Design

Enter the Realm is the first game to feature true parallax scrolling on the Archimedes and A3000 computers. The whole play area is created from layers which slide over each other creating a true 3 dimensional backdrop upon which the game proceeds.

The game features fast spectacular graphics which are all hand drawn and realistic digitised sound effects and speech which are totally interactive with the action all around you. Everything else in the game will be left as a surprise!

Specifications

Over 2 megs of high quality realistic graphics, all hand drawn.

Over 130k of in-game digitised sound effects and speech.

Over 150k of music by Peter Gillet.

50 frames per second arcade quality scrolling, animation and movement.

6 layer FULL parallax scrolling of play area (forget imitations!).

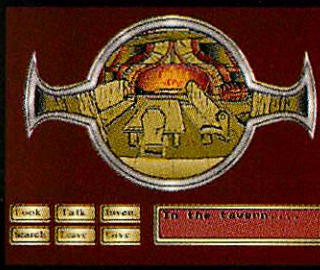
Massive sprites.

Realistic weather effects and intelligent adversaries.

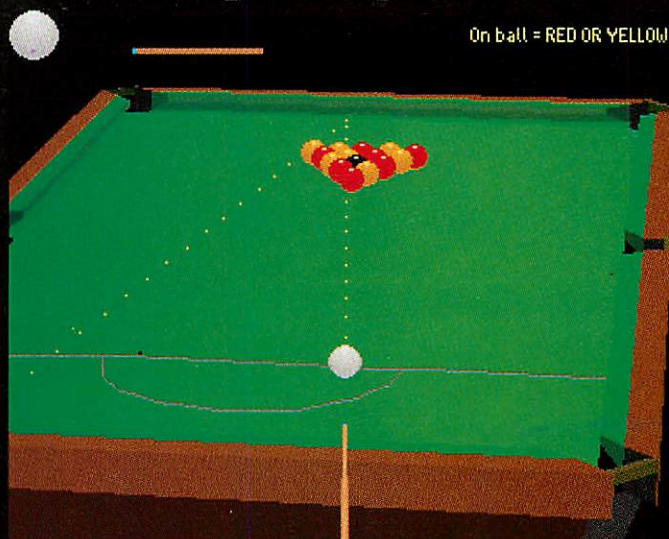
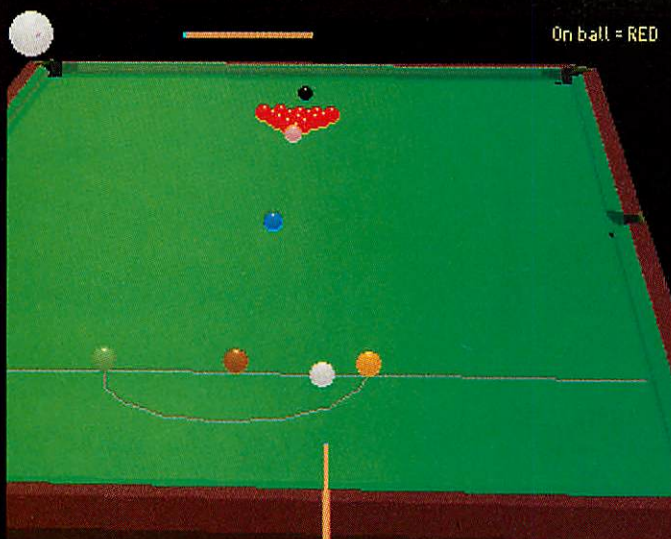
Control via keyboard or RTFM joystick.

BBC A3000 & ARCHIMEDES PRICE £24.95

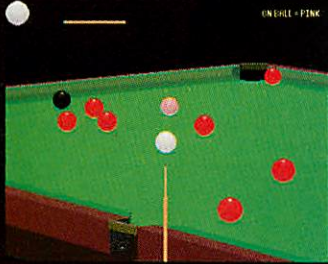
Enter The Realm is compatible with the BBC A3000 and ALL Archimedes computers



Break 147 & Superpool



"Snooker & Pool Simulator Par Excellence"



'BREAK 147' and 'SUPERPOOL' are game simulations in the true sense of the word. Gone are the power meters and fixed screw and side settings of inferior simulations and in comes a cue driven by reality software.

As in the real thing your grip on the butt of the cue (represented by the mouse), the smoothness and power of your cue action and the way in which you follow through with a shot, are all deciding factors in whether a pot is successful and whether you will retain position for the next ball. The only thing that is missing is the smokey air and a pint of beer on the edge of the table, these you will have to provide for yourself!

In both games you can choose to play on a practice table where anything goes. You can position balls wherever you wish so that you can improve your potting and positional play. You can even undo unsuccessful shots so that you can try them again. When you make that incredibly fine clip into a pocket or miss by the merest fraction, you can watch an action replay of the shot from any angle so that you can either gloat or see where you made that tiny mistake that let you down.

When you feel that you are up to the task you can play a single match against a friend or against one of the sixteen computer players. Should you feel lazy you can just sit and watch whilst two computer players battle it out between themselves. Alternatively you can enter a tournament where you will have to fight your way through the preliminary rounds and on to the coveted Final.

Whilst you are playing a match or in a tournament the game will be overseen by the referee. If in snooker you are 'on' a colour as in real life the referee will indicate the ball to you that he thinks you are going for and it is up to you to let him know if he is wrong. The referee will also call when a free ball is to be given, if there is a touching ball and your score after each successful shot.

SPECIFICATIONS

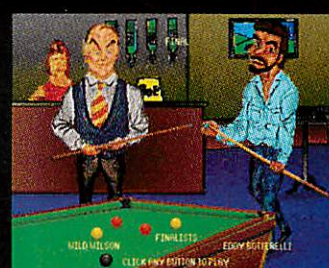
256 colour MODE 13 graphics optimized for maximum speed
225k of machine code

Over 147k of high quality sampled speech and sound effects
Ball plotting accuracy of ± 0.05 of an inch on a 12 foot table

Cue butt controlled by the Mouse
Bridge hand controlled by Keyboard

BBC A3000 & ARCHIMEDES PRICE £24.95

Break 147 & Superpool" is compatible with the BBC A3000 and ALL Archimedes computers



Reviews

"The graphics are so good that certain photos of the game being played could be mistaken for the real thing. The behaviour of the balls and cue are immaculately simulated." Acorn User, Nov '91.

"All aspects of the game are staggeringly realistic, from walking round the table and eyeing up the next shot, to the trajectories that the balls follow when they move....No longer is taking a shot an unconvincing experience comprising of aiming at the ball, selecting the power level, and hitting a key....The release of Break 147 & Superpool is a giant leap from anything ever seen on our screens, to what is arguably the most realistic snooker simulation ever to be found on a home computer." Club A3000, Autumn '91.

Reviews

"Both Break 147 and Superpool are accurate simulations of the sport. The control method works well and the result is two very enjoyable games in one pack.... whether you are a snooker & pool fan or not Break 147 & Superpool are highly recommended." Archimedes World, Nov '91.

"The most realistic snooker sim I've ever seen." The Micro User, Nov '91.

"If you're a snooker or pool fan who wants a quality simulation for the computer then this is it.... In all, an excellent implementation of the game and I'm sure that due to the realistic 3D movement around the table, practice at Break 147 & Superpool may even improve your real game." Micronet, Sept '91.

The Exotic Adventures of Sylvia Lain



"A Young Woman with 9 Lives and a License to Kill"

The Exotic Adventures of Sylvia Lain features 256 colour mode 13 graphics and supersmooth scrolling using six planes of overlapped parallax with a frame rate of 50 Hertz. The player controls a highly dextrous young woman who can jump, somersault, roll, kick, punch and more. Over 50 frames of animation in each direction are used on Sylvia alone.

Game Outline

Your mission will take you from the latest construction sights of New York to the ancient temples of the Aztecs in South America. After some magic moments you will be whisked on to the Kennedy Space Centre and finally to the B.E.N. Headquarters hidden in a giant oil refinery somewhere in the Middle East. The gameplay is a carefully blended mixture of puzzle solving, arcade adventure, beat'em up and humour.

Mission Brief

The Nobel prize winner, Prof. Doughnut, was abducted yesterday only minutes before he was due to give his historic speech explaining his solution to the world's energy problems. It is believed that the professor has achieved room temperature fusion using the highly unstable elements found only in camel dung. However the exact formula has disappeared with the Prof. We believe that his abductors were none other than B.E.N..

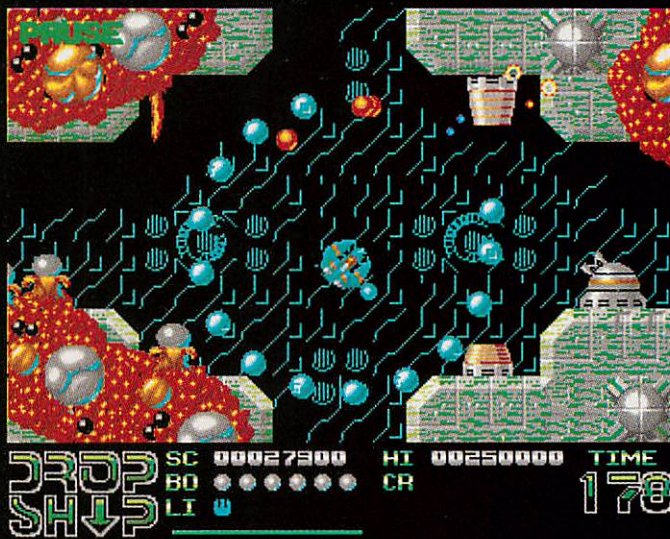
Sources have reported that during the struggle, pages from the scientist's notes were left behind. Your mission is to recover all the scattered pages of the Professor's Notes. Not only will these pages provide clues to the missing formula but the cunning academic has managed to scribble maps on each of the pages giving clues to his next location.

The professor was taken from outside the science faculty in New York. You will therefore be transported there immediately by an Ecologically friendly blimp. You will start your mission by recovering the lost pages at this location. Unfortunately our agents report that B.E.N. already have operatives working there. You are therefore licensed to kill and should use any means necessary, short of damaging the environment, to retrieve the missing papers and hopefully rescue the professor.

BBC A3000 & ARCHIMEDES PRICE £24.95
Release date hopefully mid Nov '91



Drop Ship



"Supersmooth Superfast Pure Arcade Action"

Drop Ship is one of the smoothest and fastest arcade games you are likely to see. It features superb 256 colour graphics, 15 increasingly large and diverse stages and an excellent stereo soundtrack.

The Year is 2020....The government proudly announces that the new fast breeder farm on the Mars colony is completely computer managed and totally safe, defended from attack at all times by a fully-automated tactical defence system.

The Year is 2030....Earth receives a transmission from the Mars colony. The radiation seems to have affected the management software at the fast breeder farm. The defence systems have gone haywire and the whole farm is rapidly approaching meltdown. If all the reactors are not shut down the Mars colony will be wiped out.

The defences include gun emplacements, artificial gravity generators, spores and hoards of deadly aliens. What is needed is a craft which is supremely manoeuvrable, capable of great speed and possessing awesome fire power, and a pilot of extraordinary bravery to fly it. The craft is the Drop Ship. The pilot is you.

Specifications

256 colour mode 13 graphics.

Frame Rate: 50 frames per second.

Maximum objects on screen: 150 per frame.

The ship movement in the game is accurate down to 0.0001 of a pixel.

"A brilliantly addictive game which really makes you want to barricade yourself into a room for a week in order to finish it....The graphics and animation are really superb." BBC Acorn User, Jan '91.

"Compared to both Rotor and Caverns, this game has to be tops. The gameplay is even more difficult than both and the graphics and sound far better." Risc User, Dec '90.

"Drop Ship is very arcade-like, with excellent graphics, the smoothest movements in town, nice sound effects and a good short demo." Archive, Jan '91.

"To sum up, a game that'll keep you hooked on your machine for many a late night with a cup of Hot Chock." Club A3000, Summer '91.

BBC A3000 & ARCHIMEDES PRICE £19.95
Drop Ship is compatible with ALL Archimedes computers



The Real McCoy



"This 4 Game Collection really is The Real McCoy"

U.I.M. (R.R.P. £29.95)

U.I.M. (Ultra Intelligent Machine) is a futuristic action adventure set in the oceans. It is a huge game featuring solid 3 Dimensional graphics and digitised sound effects. You must travel the oceans in your highly expandable submarine visiting the numerous ports throughout the ocean networks. As well as gaining combat skills you'll need to learn to trade in commodities, shares and currencies. There are over 250 missions to complete before you will find your goal - the U.I.M. - created to be almost a god.

"U.I.M. is a powerful game that justifies its higher price tag through guaranteed longer life." The Micro User

ARCADE SOCCER (R.R.P. £19.95)

ArCADE Soccer really is World Cup Football action at its very best. Using an overhead view to make gameplay as exciting as possible it features everything that you could want in a football game. Corners, throw-ins, goal kicks, dribbling, shooting, passing and much more. The superb graphics and smoothly scrolling pitch are complemented by a multitude of excellent digitised sound effects and music. Furthermore ArCADE Soccer is packed with options catering for up to 24 players, weather conditions, friendlies, accurate full World Cup simulation and replays to mention but a few.

"This game is excellent.... I'm not really a soccer buff, but I thoroughly enjoyed this desktop version. The micro-controlled players behave in an amazingly realistic manner." The Micro User

WHITE MAGIC (R.R.P. £19.95)

White Magic is a unique arcade adventure in which you control 4 varied adventurers: a Leprechaun, a Titan, a Warrior and an Enchanter. You can transform between all 4 characters at will and use their much needed special abilities. It features 32 massive action-packed levels filled with aggressive guards and trolls, haunting ghosts and spectres, curious objects to use and find, and much more. White Magic is not a game for the faint-hearted; it is a fast action game which requires fierce hand-to-hand combat and frantic weapon fire.

"Playability is good and I had to tear myself away in order to write this update review." The Micro User

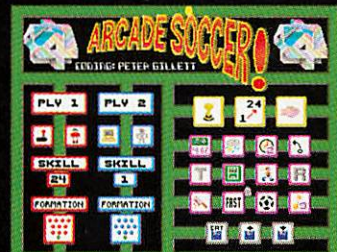
QUAZER (R.R.P. £11.95)

Quazer is a fast action arcade style game with excellent music, sound effects and graphics. It has 11 incredibly detailed and varied vertically scrolling levels filled with the most amazing assortment of baddies you are ever likely to see. Quazer is classic arcade action and will test even the most competent games player to the limit.

"The power of the Archimedes is used to produce some stunning effects..." The Micro User

BBC A3000 & ARCHIMEDES PRICE £29.95

The Real McCoy is compatible with ALL Archimedes computers



The Real McCoy 2



"This 4 Game Collection really is The Real McCoy too!"

APOCALYPSE (R.R.P. £29.95)

Apocalypse places you on the surfaces of 9 varied futuristic hostile planets colonised by very varied but always ruthless enemies. In your highly advanced and extremely fast and manoeuvrable craft you must find your way around the increasingly massive planets and systematically annihilate the enemy.

"Simply, this is the best release yet for the Arc by absolutely miles. Stunning graphics, stunning sound and masses of action. Brilliant."...Risc User

HOLED OUT (R.R.P. £19.95)

Whether you're young or old, male or female, beginner or professional Holed Out has been designed especially for you. Features include: 2 contrasting courses, 1 to 6 players, excellent 3D graphics and sound effects, full set of accurately defined clubs, slice/hook capabilities etc. etc..

"...I play golf and this is the nearest thing I've seen to the real game on a computer. The graphics are very good with a large scale golfer complete with bag and trolley (and a good swing!) and the sounds are very realistic."...Archive

"...it is quite a stunning piece of work."...The Micro User

THE OLYMPICS (R.R.P. £19.95)

The Olympics can be played by 1 to 8 players and is comprised of 6 main events: Diving, Shooting, Javelin, Swimming, Canoeing and Pole Vault. It contains a superb piece of music, opening and closing ceremonies and 14 national anthems.

"Compilation packages of sporting events may have been round on other machines for ages but the first one for the Arc is every bit as good VERDICT: A Gold Medallist."...A&B Computing (Now Archimedes World)

"Excellent graphics Classy presentation and plenty of variety Should find favour with all members of the family. Definitely recommended."... Risc User

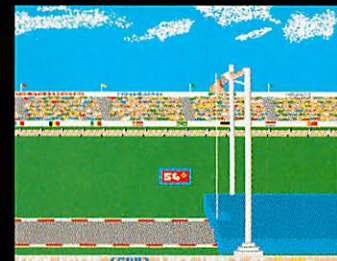
INERTIA (R.R.P. £19.95)

Inertia is a totally original game with beautiful graphics and superb digitised sound effects and music. There are 2 massive and varied landscapes to be explored and many special tiles to be collected. Your craft floats freely around the landscapes and you must exert forces upon it to guide its speed and direction. Full colour 3 dimensional maps of the 2 landscapes can be viewed at any time and are a joy just to wander around.

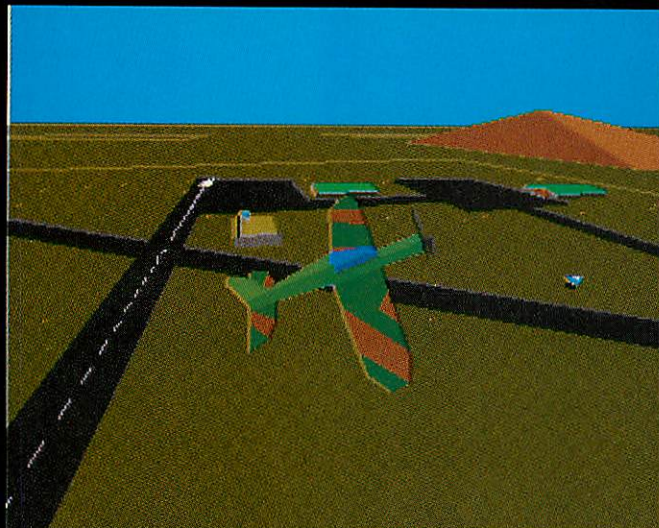
"...the accompanying music is superb Inertia is another reasonably priced game for all ages. Highly recommended."...The Micro User

BBC A3000 & ARCHIMEDES PRICE £29.95

The Real McCoy 2 is compatible with ALL Archimedes computers



Spitfire Fury



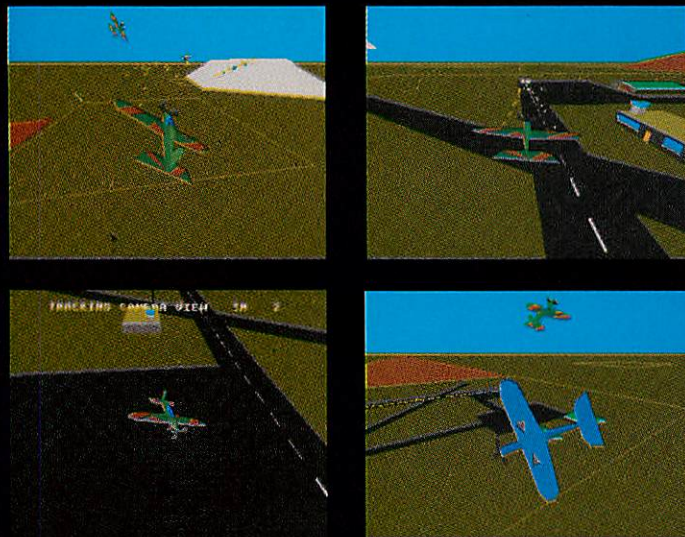
"A Superfast, Action-Packed, Fun & Accurate Simulation"

Spitfire Fury is the latest flight simulation game created by Andrew Hutchings (the author of both the Chocks Away games). In this action-filled game you take the controls of the most famous World War II fighter plane and have to tackle a range of challenging missions and tasks. The game has been designed to be an action-packed, superfast and accurate simulation with lots of fun to appeal both to the beginner and the expert.

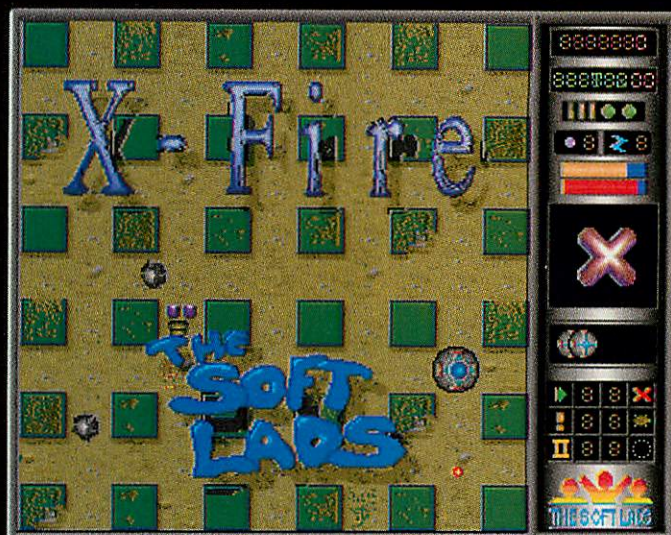
- Superfast screen update, 12 to 18 frames per second.
- Two player option using split screen or two computer serial link.
- Computer-controlled planes fighting alongside you against the common enemy.
- Lots of varied and action-filled missions with over 100 enemy targets to destroy in certain cases. Such as Escorting Bombers, Bombing Raids, Torpedo Attacks on Gun Boats, Solo and Accompanied Missions, etc.. Plus of course a range of practice missions to help you get the hang of landings etc..
- Save and load game options are provided allowing you to save the game onto disk at any point and return to it later.
- A Super Accurate model of the plane has been created taking into account wind speed, airspeed over all control surfaces, gravity, drag and lift of each control surface etc.. This makes the plane capable of performing realistic stunts such as spins, which has not yet been seen on ANY previous Archimedes flight simulations.
- Full interaction between all planes, bullets, hills, valleys, buildings etc. This means you can seek cover by flying close to hills, buildings etc. and the enemy planes (and your fellow Spitfires) can make mistakes and shoot each other or crash into obstacles.
- 256 colour graphics, digitised sound effects and complex scenery over huge expanses of land including cities, rivers, roads, hills, valleys, railways, boats, etc.
- A huge selection of viewpoints and tracking cameras are provided for you to view the action from. Plus entire flights can be recorded and watched later from any angle.

Please note that the screen shots shown are of a very early development version and therefore do not illustrate the graphics which will be included in the final version. Look out for the adverts around the release date for screen shots of the final version.

BBC A3000 & ARCHIMEDES PRICE t.b.a.
Release date hopefully February '92



X-Fire



"Highly Addictive Classic Arcade Action"

X-Fire is an exciting new arcade game which represents a welcome return to traditional arcade values.

Pit your wits and reflexes against hordes of menacing aliens within a high tech battle arena. At your disposal is an awesome array of fire power that is all that stands between you and certain destruction. Both cunning and dexterity will be required to prevail against increasingly sophisticated and dangerous opponents.

Collect bonuses to aid you in your task and augment your ship's capabilities. Regen Bombs, Split Bombs, Shield Reserves and Zaps are just a few of the bonuses available.

With crisp graphics and addictive arcade action, X-Fire combines the best qualities of classic arcade games with the advanced audio and visual capabilities of the Archimedes to create the ultimate high speed shoot'em up.

Specifications

- 256 colour MODE 13 graphics
- Highly optimised custom graphic routines
- Up to 200 objects on screen
- Over 300k of high quality sampled sound

X-Fire is an essential purchase for any serious game player in search of a lasting challenge.

BBC A3000 & ARCHIMEDES PRICE £24.95
Release date hopefully mid Nov '91



Pandora's Box



"State of The Art Arcade Adventure"

An intriguing blend of classic puzzles and full-blooded arcade action. Over 200 screens of stunning artwork and game play of the highest quality will appeal to the dedicated adventurer or arcade fanatic.

Prologue

Since ancient times a fastened box has symbolised the danger of our curiosity. This box has been opened and an entire kingdom has been poisoned by the evils unleashed.

The beast that lurked within is free and seeks the souls of men, possessing them and devouring them at will. Feeding upon misery, it profits by treachery and corruption, and in doing so brings the burden of its evils upon the land.

As the finest sorceror in the kingdom you must overcome the black magic and confine the curse once again to the only dungeon strong enough to contain such furious depravity - Pandora's Box.

Quest

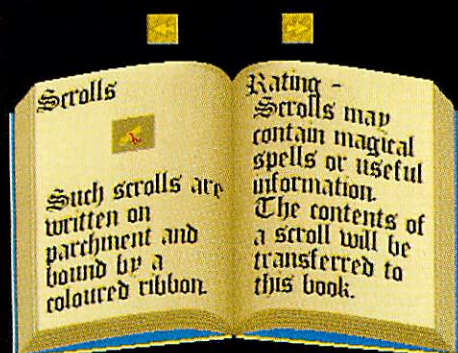
The powerful Panmetric graphics system allows you explore complex rooms and stunning landscapes whilst still having plenty in reserve to handle frenzied battles.

At first only armed with a keen wit you must acquire knowledge and magical weapons as the adventure gives way to arcade action. Exploring the length and breadth of the land you could conquer a world of magic or die in obscurity.

Technical Information

Frame Rate	25 FPS
Object Code	150k of Handwritten Arm Code
Graphics	Over 1000 sprites totalling 3Mb of graphics 256 colour, mode 13 graphics Panmetric graphics system
Sound	Digitally sampled sound effects
Computer	Any Archimedes with 1Mb or more

BBC A3000 & Archimedes Price: £24.95



Roll of Honour			
Rank	Name	Score	Done
Mayor	Alerlin	2500	25%
Peaman	Pandora	1500	15%
Beggat	Robert	1000	10%
Tramp	Zippy	500	5%
Leper	Gordon	0	0%
Awarded by ARTHUR REX			



"Anybody can be an Artist with ARCTist"

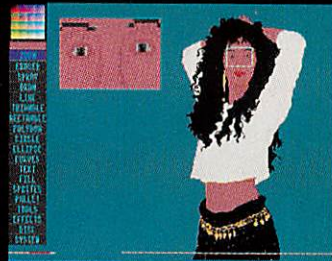
This superb painting program has been designed to be incredibly easy to use and yet totally jam packed with features. Developed with help from educational specialists and professional graphic artists, ARCTist is ideally suited to home, school and professional users.

Just a few of ARCTist's features include:

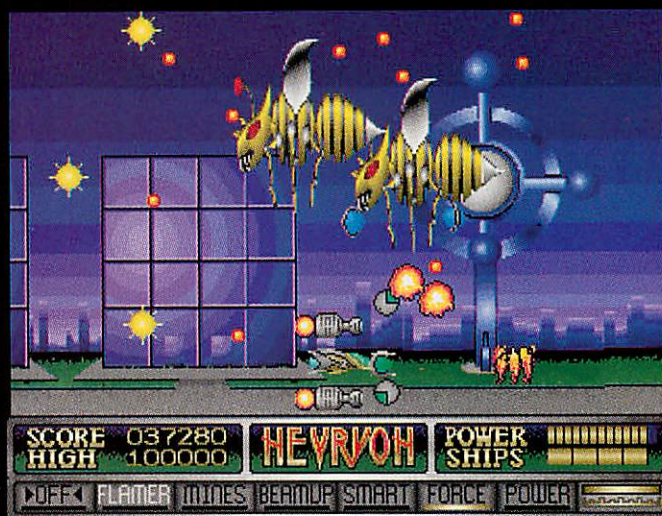
- Full screen 256 colour mode 15 editing. RISC OS compatible.
- Intelligent spray gun that 'shades' rather than just plotting random dots of colour.
- Rotation up to 2870% faster than I!Paint.
- Internal handling of up to 30 sprites with auto sprite naming, sorting, grabbing, cutting, instant masking, rotation, scaling etc..
- Masking tape option lets you mask any part of the screen for spray gun work, then lift off later to reveal what was underneath.
- Zoom around the screen at high speed and edit with pixel accuracy.
- Several brush types available with variable size.
- Undo option undoes the last change you made to a drawing, in case of mistakes.
- Special effects to distort, detect edges, trace with colours, trace with sprites, swap colours, dither colours, blur, anti alias etc. etc..
- Special proportionally spaced outline fonts that don't require any memory in the font cache. Put a rectangle around the area you want the text to fit and ARCTist will scale it to fit.
- Rectangle copy, move, rotate and scale. Also, accurate shape cut copy, move, rotate and scale tools to slice out the exact part of the screen you want.
- Sprite animation with built in sequence editor, offset generator & flight path editor.
- Load, edit and save fill pattern files. ARCTist fill patterns are twice the size of normal ones.
- Two user definable drawing brushes, can be defined directly or grabbed from anywhere on the screen.
- Several hundred Kbytes of clip art included.

BBC A3000 & ARCHIMEDES PRICE £24.95

ARCTist is compatible with ALL Archimedes computers



Nevryon



"A Superlative Action-Packed Arcade Game"

During The First Great Space War of 2100 reserves of titanium, the chief metallic element involved in ship construction, begins to run out throughout the known universe. Only the human-colonised planet - Nevryon - has large reserves. You must destroy all alien forces which are attempting to take over Nevryon.

To succeed you must complete 4 very different missions: destroy the alien bases on the Surface and in the Caves of Nevryon, plus destroy from within both the Alien Battlecruiser and the huge Alien Beast. The aliens will attempt to attack and confuse you with every type of vessel they possess.

You begin each mission with a standard short range V5 Fighter. Anything larger would undoubtedly mean detection and death before you could even begin. However, once in the thick of the action, your fighter is able to collect and use a large array of extra weaponry and shielding. You will be on your own but you will not be forgotten....

Specifications

Over 1.5 Megs of 256 Colour Mode 13 Graphics. Over 60 Objects On Screen at Once 25 Frames/Second Scrolling and Animation. 6 Levels of True Parallax Scrolling

Big Sprites. 4 Channel Sound Played at 20kHz

6 Pieces of Superb Stereo Music. Multi-Channel 'Live' Stereo Sound

"Fans of strategy games won't like this one, but for the masses who enjoy total alien genocide, dushdi graphics and equally appealing sound, this game must surely be worth a mention on your list to Santa. I wholeheartedly recommend this game as the definite shoot'em up for the Arc..." Club A3000, Summer '91.

"Nevryon features the best graphics and sound I have ever come across. All of the superb sprites are packed with amazing detail and the animation and scrolling are completely flicker-free." Micro User, Nov '90.

"The 4th Dimension have come up trumps with another classic...Graphics are superb...The number of animated objects, missiles, scenery and details will put many ST and Amiga to shame with the sheer power of the ARM chip." Micronet, Aug '90.

BBC A3000 & ARCHIMEDES PRICE £19.95

Nevryon is compatible with ALL Archimedes computers



COPYRIGHT 1990 THE 4TH DIMENSION
GRAPHICS AND CODING
BY GRAEME RICHARDSON 1990



Chopper Force



"Superfast Action-Packed Chopper Sim"

Gameplay

The year is 2023 and advanced weapons' systems such as laser-guided munitions and stealth technology has fallen into the hands of a terrorist organisation.

You pilot a highly advanced helicopter on a number of varied and increasingly challenging missions to attack the terrorists, 'accompanied' by NEXT GENERATION uncannily realistic 3D graphics.

Hardened flight simulator addicts who may no longer find it challenging to pilot a plane will just love learning how to master the controls of the advanced and highly manoeuvrable military helicopter in Chopper Force. And in 2023 there are new super high technology 'smart' weapons to be mastered!

In Chopper Force there are missions that you could never dream of attempting in a plane simulator - such as picking up military hardware with a rope and transporting it to where it is needed as quickly as possible or conveying important intelligence information from the top of a skyscraper in one city to where it is vitally needed in a neighbouring city.

Experience a feeling of total power by hovering a safe distance from a convoy supplying the terrorists and picking them off from a safe distance with your smart missiles. Knock out communication lines going into and out of their HQ to totally cut them off. You will come across their own advanced helicopters, jets, tanks, laser-guided missiles, the dreaded flak, etc..

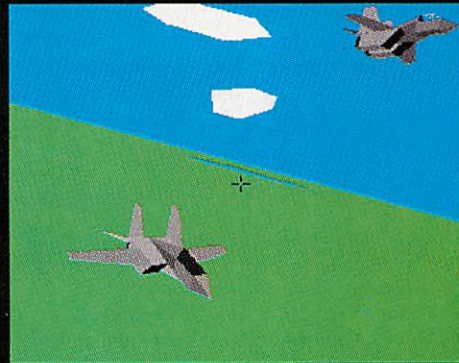
The final highly tasking mission involves attacking the enemy HQ to totally annihilate the terrorists.

If you can get this far then you are truly worthy of the Chopper Force.

Specifications

Graphics: 256 colour mode 13 graphics
Frame Rate: Up to 25 frames per second
Polygons per frame: Up to 500
Polygons per object: Up to 80

BBC A3000 & ARCHIMEDES PRICE t.b.a. Release date hopefully March '92
The screenshots shown were taken from a young version of Chopper Force



The Fourth Dimension

SPECIAL OFFER: If you buy 3 or more products directly from us you may deduct £10 from the total cost



Chopper Force (early version)



Enter The Realm



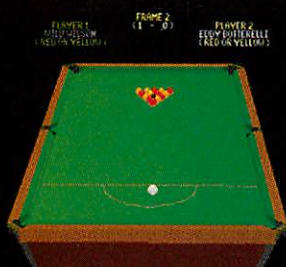
Saloon Cars



The Exotic Adventures of Sylvia Lain



Pandora's Box



Break 147 & Superpool



Grievous Bodily 'ARM'



Chocks Away Extra Missions

ACORN BBC A3000 & ARCHIMEDES SOFTWARE

The following software is compatible with the BBC A3000 and ALL Archimedes computers

ARCADE GAMES

Grievous Bodily 'ARM' (Hopefully late Nov. '91)	24.95
Cataclysm (Hopefully late November '91)	24.95
X-Fire (Hopefully mid November '91)	24.95
Boogie Buggy (Arcade Graphics & Gameplay)	24.95
Nevryon (Unbelievable Graphics & Gameplay)	19.95
Inertia (Isometric Arcade Action)	19.95
Apocalypse (3D Mega Game - 9 Planets)	29.95
Drop Ship (Superfast Arcade Action)	19.95
Arcade Soccer (World Cup 1-24 Players)	19.95
The Olympics (6 Varied Events - 1-6 Players)	19.95
Quazer (Furious Arcade Action)	11.95

3D SIMULATIONS/GAMES

Chopper Force (Hopefully March '92)	t.b.a.
Spitfire Fury (Hopefully February '92)	t.b.a.
Saloon Cars (The Ultimate Driving "Game-ulation")	24.95
Break 147 & Superpool	24.95
(Incredibly Realistic Snooker and Pool Simulator)	
Chocks Away (Biplane Sim. for 1 or 2 Players)	24.95
Chocks Away Extra Missions	19.95
(26 Extra Missions plus some Superb Enhancements)	
Chocks Away Compendium	39.95
(Chocks Away + Chocks Away Extra Missions)	
Powerband (Superfast Formula 1 Grand Prix)	24.95
E-Type Compendium (3D Classic Car Racing)	24.95
(E-Type + Extra 100 Miles + Designer)	
Holed Out Compendium (3D Golf 1-6 players)	24.95
(Holed Out + Extra Courses Vols 1 & 2 + Designer)	

ARCADE ADVENTURES

The Exotic Adventures of Sylvia Lain	24.95
(Release date hopefully mid November '91)	
Pandora's Box (Stunning Graphics & Gameplay)	24.95
Enter The Realm (Supersmooth Arcade Action)	24.95
Pysanki (Futuristic Arcade Adventure)	19.95
Man-At-Arms (Medieval Arcade Adventure)	19.95
U.I.M. (Massive 3D Action Adventure)	29.95
White Magic (Magical Arcade Adventure)	19.95
White Magic 2 + Designer	19.95

EDUCATIONAL SOFTWARE

(from Triple 'R' Education)

Picture Book	19.95
Money Matters	19.95
Data Word	19.95
Target Maths	19.95
Converta-Key	19.95

GRAPHIC ADVENTURE

The Wimp Game (Unique Graphic Adventure)	19.95
--	-------

COMPILATIONS

The Real McCoy (4 Game Compilation)	29.95
(U.I.M., Arcade Soccer, White Magic & Quazer)	
The Real McCoy 2 (4 Game Compilation)	29.95
(Apocalypse, Holed Out, The Olympics & Inertia)	

SPEECH & ART SOFTWARE

ARCTist (Easy to use Professional Art Package)	24.95
ARCTiculate (The Animated Speech Synthesizer)	24.95

BBC MICRO, MASTER, COMPACT & ACORN ELECTRON

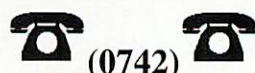
Title

BBC B & BBC B & Master
Electron Master Compact
Cassette 5 1/4" Disc 3 1/2" Disc

Q-Master (Realistic Pool Game)	---	14.95	15.95
Picture Book (Educational Software)	12.95	14.95	15.95
Money Matters (Educational Software)	12.95	14.95	15.95
Data Word (Educational Software)	12.95	14.95	15.95
Target Maths (Educational Software)	12.95	14.95	15.95
Converta-Key (Educational Software)	12.95	14.95	15.95
E-Type (3D Classic Car Racing)	9.95	14.95	15.95
Nevryon (Pure Arcade Action)	---	14.95	15.95
Inertia (Isometric Arcade Action)	9.95	12.95	13.95
U.I.M. (Massive 3D Action Adventure)	---	19.95	21.95
Holed Out (3D Golf for 1 to 4 Players)	12.95	14.95	15.95
Holed Out Extra Courses Vol.1	9.95	11.95	12.95
Holed Out Extra Courses Vol.2	9.95	11.95	12.95
Arcade Soccer (Fast Action - 1 or 2 Players)	9.95	12.95	13.95
White Magic (Magical Arcade Adventure)	9.95	12.95	13.95
White Magic 2 + Designer	9.95	12.95	13.95
The Art Studio (Easy to Use Art Package)	9.95	12.95	---

HOW TO ORDER

TELEPHONE



(0742)

769950 or 700661

ACCESS & VISA
Accepted

24 Hour Service 7 Days a Week

SAME DAY DESPATCH

All orders are despatched immediately by 1st Class post. Carriage is paid by us in the U.K. (Overseas orders add £3 per product).

FULL DETAILS OF ALL OUR SOFTWARE ARE AVAILABLE ON REQUEST & ARE SENT WITH ALL ORDERS

LETTER

Simply send us a quick letter telling us the software you require, your name and address, and payment via cheque, postal order or ACCESS or VISA card details.

The Fourth Dimension,
1 Percy Street,
Sheffield, S3 8AU,
England.

NO Quibble GUARANTEE

If any of our discs ever become faulty (for whatever reason) we will replace them free of charge immediately. Simply return them to us with your name and address.

INSPIRATION

The most comprehensive music sequencing package available for the Archimedes.

Come and visit our demonstration area, or send a blank disc for a demo version. Fully Risc OS compatible. Purchase with Archimedes (special price), or simply add it to your existing system. All you need is a MIDI interface.

!Inspiration offers a control panel featuring: Replace and Overdub record modes • Cue Start and End • System Status Display • Multiple Save capabilities, and many other features. Version 1.03 now being supplied

Music Software	Clares Armadeus	MUSIC PACKAGES
Inspiration	Sampler Software 68.00	Inspiration + RhapsodyII +
Pull 250 track 99 Reel MIDI sequencer	Armadeus Software & hardware 170.00	Acorn MIDI Module (A3000) 260.00
Clares Rhapsody II	Notate (Longman Logotron) 55.00	
Clares Rhapsody II upgrade	Tracker (serial port) 42.00	A3000LC colour system +
	Acorn MIDI module A3000 45.00	Inspiration + RhapsodyII +
	Acorn MIDI Module A400 65.00	Acorn MIDI Module (A3000) 1000.00

DTP	SOME GAMES
Impression II (CC) 130.00	Alien Invasion (AJ) 16.00
Impression Junior (CC) 74.00	Apocalypse (4th Dim) 20.00
Impression Business Supplement 45.00	Apocalypse (4th Dim) 25.00
Tempest (Clares) 99.00	AR Circulate (4th Dim) 20.00
Ovation (Beebug) 99.00	Blowpipe (4th Dim) 16.00
	Boogie Buggy (4th Dim) 20.00
	Break 147 (4th Dim) 20.00
	Chess 3D (Micropower) 16.00
	Chocks Away (4th Dim) 20.00
	Chocks Away Compendium 30.00
	Chocks Away Extra 16.00
	Chuck Rock 20.00
	Drop Ship (4th Dim) 16.00
	Elite 32.00
	E-Type (4th Dim) 16.00
	E-Type 100 miles (4th Dim) 14.00
	Fine Racer (Eterna) 16.00
	Holed Out (4th Dim) 16.00
	Hostages (Superior) 15.00
	Inertia (4th Dim) 16.00
	Interdutor II (Clares) 36.00
	Jigsaw (4th Dim) 28.00
	Mig 29 (Donmark) 34.00
	Neuron (4th Dim) 16.00
	Powerband (4th Dim) 20.00
	Pyramid (4th Dim) 16.00
	Saloon Cars (4th Dim) 20.00
	The Real McCoy (4th Dim) 25.00
	The Real McCoy II (4th Dim) 25.00
	The Wimp Game (4th Dim) 16.00
	U I M (4th Dim) 25.00

DATABASES	Archimedes Computer Systems
Multistore (Minerva) 175.00	A3000 Entry system 580.00
AlphaBase (Clares) 36.00	A3000 Colour system 780.00
System DeltaII Minerva 48.00	A3000LC MKII Entry system 640.00
	A3000LC MKII Colour system 850.00
	A5000 single floppy disc 990.00
	A5000 40MB hard disc including multi-scan monitor 1450.00
	A5000LC 40MB hard disc including multi-scan monitor 1530.00
	A540 Entry system 2400.00
	A540 Colour system 2650.00
	A540 with multisync monitor 2900.00
	Eizo 9060S Multiscan Monitor 399.00
	Eizo 9070S Multiscan Monitor 599.00
	Upgrades
	A3000 2nd Mb 50.00
	A3000 2nd to 4th Mb 155.00
	Arm 3 for A400/I 280.00
	Arm 3 for A3000 330.00
	Syquest removable 42Mb drive 400.00
	Some second hand A400/I available.
	Typical example A410/I upgraded to 4Mb and 50Mb HD £1000.00

=AMPSOUND=

153a Victoria Street, St Albans, Herts AL1 3TA
Telephone 0727 50075 Facsimile 0727 58977
Please add VAT to all above prices

Accounts Manager

The Professional Solution

- ✓ **FEATURES**
- ✓ Sales, Purchase, Nominal Ledgers
- ✓ Budget Reports
- ✓ Sales/Purchase Analysis
- ✓ Debt Chasing and other letters
- ✓ Aged Debt Analysis
- ✓ Statements (User Definable)
- ✓ Re-Occurring Transactions
- ✓ Receipt/Payment/Refund & Contra Processing
- ✓ Invoice Search Facility
- ✓ RISCOS multi-tasking
- ✓ Text Editor
- ✓ Trial Balance/Quick Ratio
- ✓ VAT Return
- ✓ Profit/Loss & Balance Sheet
- ✓ Self re-building data files
- ✓ Hold transaction or Account
- ✓ Miscellaneous Accounts
- ✓ Upgradeable
- ✓ Full Support included
- ✓ Mouse or Keyboard Driven

Accounts Manager is the ultimate Archimedes Accounting system on the market today. It is not written to run under an emulator and is not ported from another machine, it simply takes full advantage of the raw power of the Archimedes and A3000 computers to ensure that the computerisation of your accounts is as simple as possible.

Accounts Manager is very simple to learn and use, data entry is clear and logical, reports are concise and to the point.

Because Accounts Manager puts you in control of your finances, it can greatly improve your cash flow, as well as perform the traditional functions such as VAT returns and Profit/Loss reports.

Priced at only £299.00 + VAT, there is really only one choice if you are serious about computerising your accounts. Contact your dealer for a demonstration TODAY.

KENDAL COMPUTER CENTRE
68 Stramongale, Kendal, CUMBRIA LA9 4BD
Tel: 0539 722559

TELETEXT ADAPTOR

ADD TELETEXT TO YOUR COMPUTER

A3000/ARC. PRICE INCLUDES:

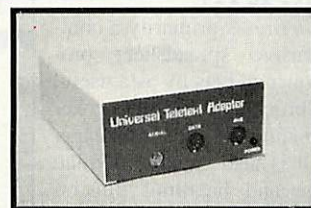
- Podule socket lead
- User notes
- TTX V2.13 Software

£94.00 Inc. P&P

BBC B & MASTER. PRICE INCLUDES:

- User port lead
- SATS Software
- User notes

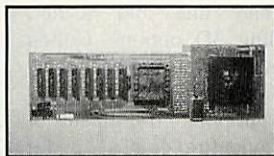
£94.00 Inc. P&P



A305/310 4 MEG MEMORY UPGRADES

- Low power 8 chip design
- DIY fitting, just plug in
- Accepts our ARM 3 processor

£243
Inc. P&P



SPECIAL OFFER:
Fitted with ARM 3
(as illustrated)

£420
Inc. P&P

A3000 MEMORY UPGRADES

- Low power design, only 8 chips
- Bare Board, 1Mb or 4Mb
- Easy to fit just plugs in
- Screw fixed for reliability
- PCB size only 175x50mm

1 MEG £40 (Gives 2 Meg total memory) Please call for details

4 MEG £135 (Gives 4 Meg total memory)

BARE BOARD £23 Prices Inc. P&P

MEMC1A MEMORY CONTROL UPGRADE (2 CHIP SET)

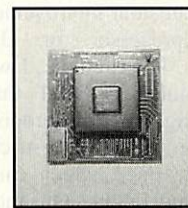
- Boost speed by 10% on A310/440
- Recommended for ARM3 use
- Essential for SCSI & floating point users

£38
Inc. P&P

ARM 3 PROCESSOR

- RISC-OS Armspeed software
- Cache operation at MHz
- DIY plug in design
- Fits A300/400 series
- 3-6 times speed increase

£185
Inc. P&P



FOR FURTHER INFORMATION TELEPHONE: 0635 524008 OR 0622 747416
HOURS OF BUSINESS: 9.00 AM - 5.30 PM (24 HOUR ORDERING FACILITY). PRICES EXCLUDE VAT, BUT INCLUDE CARRIAGE CHARGES (UK MAINLAND), PACKAGING AND INSURANCE



GROUND CONTROL
ELECTRONICS LIMITED

FURTHER DETAILS
ON REQUEST
DEALER ENQUIRIES
WELCOME
QUANTITY DISCOUNT
AVAILABLE

UNIT 7, KINGFISHER COURT, HAMBRIDGE ROAD, NEWBURY, BERKSHIRE RG14 5SJ. TEL: 0635 524008 or 0622 747416 FAX: 0635 528115

Colton Software's original *Pipedream* package was designed to be a veritable jack of all trades package for the BBC A3000/Archimedes, offering a spreadsheet, plus wordprocessor and database capabilities. The latest incarnation of this package – *Pipedream 4* – features a number of enhancements, including an improved Risc OS interface and an impressive graphs and charts system.

I have been a *Pipedream* user since before the Archimedes was unveiled – you might remember its predecessor, *View Professional* for the BBC Micro. *Pipedream* arrived when *View Professional* was enhanced and recoded in the C language after the Archimedes was launched in 1987. That was in pre-Risc OS days and the original version of the package was strictly a character-based application running under the old Arthur operating system. *Pipedream 3* was launched with the advent of the Risc OS desktop system we all know and use today.

WHAT IS IT?

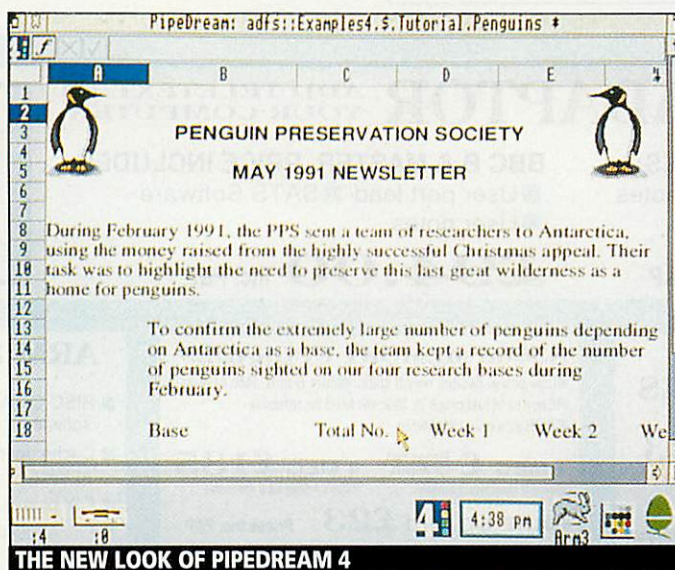
Pipedream is primarily a comprehensive spreadsheet program which gets by as a useful wordprocessor, spell-checker and a simple database manager which is also capable of mail merge and handling illustrations. I have personally used it daily for years as a wordprocessor and I know others who swear by its database facilities.

This latest revision of *Pipedream* (version 4.10) doesn't offer what I would call fundamental improvements for wordprocessor or database users. For example, I was disappointed to find that text highlighting in wordprocessor mode is still restricted to whole lines, which can make editing fiddly. On the other hand, text scrolls more easily and predictably, while the cursor seems better controlled. Wordprocessor template files make life easier too.

Colton Software is reasonably claiming that *Pipedream* can be used as a database, but it is very much a compromise with the spreadsheet and is tricky for all but the simplest of operations. However, the general versatility of the pack-

SUMMING UP

Pipedream 4 is the latest version of the popular spreadsheet. But is it the final word? **IAN BURLEY** finds out



THE NEW LOOK OF PIPEDREAM 4

COMPARISONS

	PIPEDREAM 3	PIPEDREAM 4	SCHEMA
VERSIONS TESTED	3.14R	4.10	1.18
Price (ex VAT)	£147	£196	£114
Initial memory used	512K	832K	640K
2000 value CSV load	12sec	9sec	80sec
Memory used by above	608K	960K	800K
Liardet recalculate	7sec	9sec	23sec

age tends to excuse its idiosyncrasies. To be able to create a document containing parts of a database and spreadsheet will still be a welcome novelty to many users.

PICK UP A PENGUIN

Where *Pipedream 4* clearly scores is in its brilliant new graphs and charts section. Previously, *Pipedream* users had to buy a separate graphs and charts utility to transform their spreadsheets into good graphical presentations.

Pipedream 4's charts look set to change all that. Boring old solid bar charts can now be spruced up by graphic objects imported from *Draw*. Colton decided that a penguin figure would capture the imagination, hence the term Penguin Graphics. Your graphs can have lots of little penguins piled on top of each other, or a single penguin stretched out or compressed to fit the value it represents. But you are not restricted to penguins, the template can be replaced by any *Draw* object you choose.

You can have different graphics objects (breeds of penguins, perhaps) representing different values in the same graph. Graphics can also be pasted on to graph backgrounds. The constituent objects of a graph, which can be exported as a *Draw* file, are easily manipulated for refining the layout. Naturally, graphs are hot-linked to the spreadsheet data they are referenced to – change a sheet value and the graph is instantly updated.

WHAT'S NEW

Overall, *Pipedream 4* offers the four basic types of graphs: pie, bar, line and scatter, including 3D options. Colton is content to leave it at that for the moment, since relatively few want polar co-ordinates or fancy scientific graphs – and if they did, they would probably be more likely to invest in something like *Graphbox*. However, of the graph types you get with *Pipedream 4*, they are the best I have seen on the Archimedes so far – and that is even before the penguins come out to play.

As well as the added graph capabilities there are a number of more subtle changes to the package. *Pipedream*'s spread-

sheet functions have been improved. There is now no option for recalculating by row or column – natural fashion recalculation is fixed instead, and the user is encouraged to explore the custom function facility more.

Some previous options, like global iteration and file linking, have been removed. Colton's argument here is that use of custom functions is potentially more elegant and powerful. Strings must now be enclosed by double inverted commas (such as "string") – this mainly affects database use as formerly condition arguments were strings. As a result, *Pipedream 4* is now more versatile in its handling of string types.

Pipedream's And, If and Or key words are now more efficiently evaluated for faster calculation. There are some new date and time functions, including one to return to today's date.

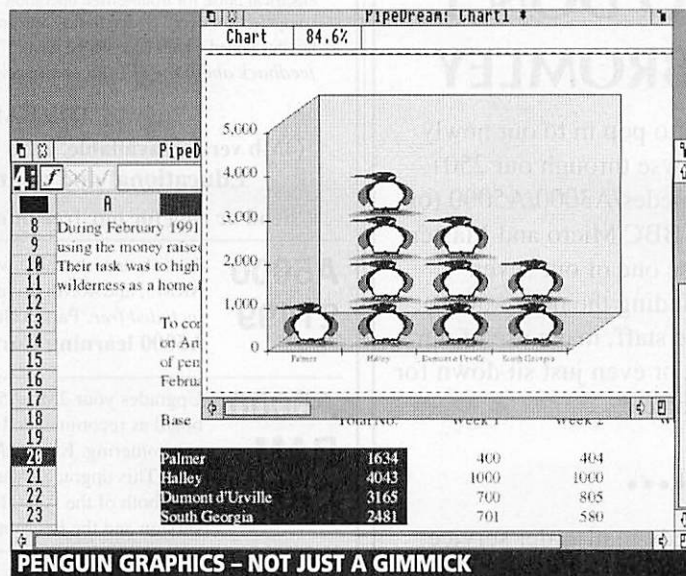
The above is just a sample of a myriad of relatively small changes made. Inevitably, some users will find certain problems when loading very complex *Pipedream 3* sheets into the new package, although I managed to avoid any problems with my own library of sheets. A useful set of compatibility notes is provided for reference.

IN USE

Immediate changes are noticeable in the new edit window. It looks much smarter, column widths can be altered instantly using the mouse and a formula icon gives convenient pointer access to spreadsheet function keywords. Next to this are the tick and cross buttons used in formula editing. At the corner, where the column and row headings meet, is a rectangle which darkens when a block has been marked. This also acts as a counter during calculations – a useful activity indicator.

On the icon bar you now get a current documents list option, a document template load option and a set of choices or preferences for setting things like menu verbosity, spell-check defaults, displayed colours and so on.

Pipedream 4 is claimed to be the fastest spreadsheet on



PENGUIN GRAPHICS – NOT JUST A GIMMICK

SECOND OPINION

I immediately thought *Pipedream 4* was easier and more aesthetic to use than before. The windowed display is clearer with slot information easier to view. Function key definitions have been simplified too, with more control gained by using the mouse.

For example, there is the ease with which columns can be widened and shortened just by dragging the mouse over them. However, text editing still requires you to mark whole slots rather than individual characters which can still lead to some confusion until you get used to it. The charts and graphs facilities are a welcome addition which makes impressive outputs very easy to obtain without the fuss of exporting data to secondary applications. Graphical output can then be re-merged with the text to produce professional looking documents very simply.

On the whole *Pipedream 4* seems to have had a major overhaul from previous versions, with many jagged edges smoothed out to provide a very slick and powerful desktop application.

Paul Vigay, BAU columnist

the Archimedes. With the standard Liardet benchmark, it proves to be a little over twice as fast as its nearest rival, *Schema* from Clares Micro Supplies. However, we did manage to produce some dummy test sheets which proved faster on *Schema*, although exactly why this was the case remains a mystery.

Pipedream 4 will try and do as much as possible in the background in order to prevent the user from being locked out of the computer. This is a useful point and unlike many other Risc OS packages, including *Schema*, when you are faced with an hour-glass, a percentage-to-finish indicator is provided as well.

THE SPEED TEST

Oddly enough, *Pipedream 4* proved slightly slower than *Pipedream 3* in the Liardet test. *Pipedream 4* is faster in other areas, however. CSV (comma separated value) files

are loaded by *Pipedream* almost 10 times faster than with *Schema* and 25 percent quicker than with *Pipedream 3*. If you need to regularly import large chunks of CSV data into your spreadsheets, CSV import speed will be an important factor.

I must mention that much difficulty was encountered in moving test spreadsheets between *Schema* and *Pipedream*. Neither have facilities to import files from the other's format. Colton insists that there isn't any demand for a *Schema* loader, whereas Clares is promising a *Pipedream* loader in its long-promised version 2.0 of *Schema*.

Both have utilities to swap *Lotus 1-2-3* files, but after lots of head scratching, the only reliable way we found of transferring files using this method was from *Schema* to *Pipedream*. We didn't have much luck when we tried to make the *Schema/Lotus 1-2-3*

translator work properly going in the opposite direction.

CONCLUSION

Pipedream 4 is a welcome successor to *Pipedream 3*. The graphs and charts section, penguins and all, is excellent. With the exception of windows flickering occasionally, the new Risc OS interface is much smoother and the background operation works better than before. These, plus auto column widths, are very welcome features.

However, I am still very frustrated by the continuing standstill in wordprocessor editing enhancements and Colton has advised me not to hold my breath on that point. Whereas *Pipedream 3* would just about shoe-horn into a 1Mb A3000/Archimedes, this is not the case with *Pipedream 4*. You will need 2Mb to run the new version.

Colton Software claims that the new package is the best spreadsheet for the Archimedes. I would certainly recommend it over the existing version of *Schema*, but then I also await *Schema 2* with interest. *Schema's* impressive Basic-like programming language is potentially more powerful than *Pipedream's* custom functions and, if you need complex programmability, you may need to study the *Pipedream 4* specifications more closely.

On the negative side, while still good value, *Pipedream* is not as affordable as it used to be and there is a lack of much-needed improvements to the wordprocessor. On the plus side, *Pipedream 4* offers improved refinement, superb graphs and CSV speed.

For the vast majority of users, *Pipedream 4* is more simple and versatile than the competition and remains the best option to go for.

PRODUCT DETAILS

Product: *Pipedream 4*
 Supplier: Colton Software, 2 signet Court, Swanns Road, Cambridge CB5 8LA
 Tel: (0223) 311881
 Price: £196 plus VAT
 (*Pipedream 3* users can upgrade for £80 plus VAT).
 Machines: BBC A3000 and Archimedes with 2Mb of Ram

APOLOGIES TO ALL THOSE WHO DON'T LIVE NEAR BROMLEY

You probably won't be able to pop in to our newly refurbished showroom, browse through our 250+ software titles for the Archimedes/A3000/A5000 (or 100+ titles for the trusty old BBC Micro and Master Series), sit down and use one of our seven demonstration systems (including the new A5000), chat with our knowledgeable staff, make use of our high-quality repair workshop, or even just sit down for a cup of coffee!

BUT....

at least you can use our speedy mail-order service, even for repairs, and we also accept telephone orders by Access/MasterCard and Visa, so all is not lost!

THE DATA STORE

6 CHATTERTON ROAD, BROMLEY, KENT, BR2 9QN
Tel: 081-460 8991 Fax: 081-313 0400
(Closed Wednesdays)

A310 memory from £99

8-chip design ensures low power consumption. Compatible with ARM3 upgrades, backplanes, hard discs etc. Larger OS ROM option. Four-layer circuitry reduces electrical noise for trouble-free operation. We have been upgrading 300 series computers for over 2 years. In that time, not a single upgrade which we have fitted has developed a fault and needed repair. "we have had a lot of very positive feedback about the IFEL memory upgrades". Archive.

2Mb RAM - £99

(4Mb version available. 2Mb board is upgradable to 4Mb)

Educational and quantity discounts apply.

Send or ring for our free information sheet. Then decide.

A5000 £1499 Acorn's new machine with RISC OS 3, multisync monitor, ARM3, and 40Mb drive. *An extra 2Mb of RAM (4Mb total) is included free.* Part exchanges considered.
A5000 learning Curve - £1530. (£1797.75 inc. VAT)

A5000 RAM £105 Upgrades your 2Mb A5000 to 4Mb. High quality 4-layer board as recommended by Acorn. Fitting does not involve any soldering. **Extra 2Mb (4Mb total) £105.**
N.B. This upgrade is currently supplied free of charge with both of the A5000 systems above (ie standard version and the Learning Curve).

A3000 RAM

- Only 8 RAM chips - low power consumption
- User fittable - no soldering required
- Available as a "bare board" (ie sockets, but no RAM)
- **4Mb - £148.95 2Mb - £55 Bare board - £25.50**

All prices exclude VAT.



Further information and price list from;



IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD.
(0752) 847286



AVP

From Britain's largest Supplier of Educational Software

2 Comprehensive Guides to over 2500 Educational Programs for the BBC, Archimedes, A3000, A5000 & IBM PC

All in Stock for Immediate Delivery

- 1 For 5-11 age group**
- 2 11-Adult**

For Your Free Copy Contact
AVP School Hill Centre
Chepstow Gwent NP6 5PH

Telephone 0291 625439
Fax 0291 629671

THE BIG BLACK CAT ALOGUE

TAKE AIM

Image processing does not have to be expensive, as **DAVID KNELL** explains

When it comes to image processing, *AIM* (*Another Image Manager*), is hard to beat for value. It costs only £1 in its most basic form – yet it seems to provide image processing under Risc OS that is comparable with systems that cost hundreds of pounds to run on other, extremely expensive workstations.

AIM is a sophisticated Public Domain (PD) suite of programs which has been ported to the Archimedes. The Risc processor in the Arc is ideally suited to image processing and the only limitation is the display hardware – ideally, the machine would be able to display 256 levels of grey at once, instead of the 16 available. However, there are ways around this.

ON OFFER

So what facilities does *AIM* provide? Well, just about everything you need for processing images. *AIM* comes with a set of macro files (programs) which demonstrate many possible uses, some of which we have shown in the examples here. One of the best examples, provided with the suite, can take a circuit diagram and identify which components are resistors, capacitors, and so on. Image processing also has many commercial uses, for instance the Milk Marketing Board use it to quantify the number of bacteria found in a milk sample.

AIM allows processing on four 256 x 256 images in 256 levels of grey – this is more than adequate for most image processing tasks. However, it can only cope with a scan of about 0.5in square at 400 dpi (dots per inch). The resolution is perfectly adequate for images captured from video.

In order to display 256-level greyscale images on a machine which can only display eight levels at a time (using the

standard desktop palette) *AIM* uses a Sigma-Delta, or dithering technique, where errors are spread out so that the display appears to show 256 distinct levels of grey. The images are held internally to 256 levels, and all image processing operations happen at this level – the dithering only occurs when the image is displayed.

AIM under Risc OS performs very well compared to similar software on other machines. One published benchmark shows an A5000, running *AIM*, performing at three times the speed of an Apple MacIIx, which costs considerably more than the A5000. To run, the package requires a machine with 2MB of memory, and preferably a multisync monitor.

CONCLUSION

AIM is, quite simply, good fun. Reading up on the subject will definitely increase your enjoyment – we published a *BAU* series on image programming in 1990.

Images can be scanned or grabbed from a digitiser (*AIM* provides built-in support for the Watford one.) This package is also an excellent platform for more serious image processing work and can be used for a large number of everyday image processing tasks on the Arc. And, at the price, how can you resist enhancing your image?

PRODUCT DETAILS

The *AIM* software is Public Domain and can be obtained by sending a £1 coin, a formatted disc and an SAE to: *AIM* Offer, 8 Coton Road, Grantchester, Cambridge CB3 9NH. *AIM* is also distributed by Linguinity and costs £25 plus VAT, including the cost of a printed manual, which I recommend. Linguinity can be contacted on (0986) 85476.

ALTERING IMAGES

The source picture on the left looks dim and blurred, as if it were a photograph taken through fog. The first operation on the image was histogram equalisation, which involves spreading out the range of grey levels to cover the full range available. This has the effect of increasing the contrast of the image. The second operation was to apply a simple sharpening filter, which reverses the original blurring.



BEFORE: Original image, slightly blurred, low contrast



AFTER: After histogram equalisation and sharpening

Below is an example of noise removal from an image. The source image (left) has a large amount of 'salt-and-pepper' noise (black and white specks) which is removed using a median filter.

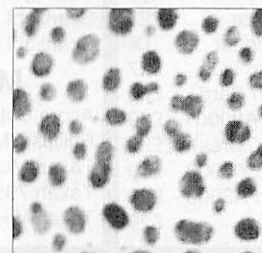


BEFORE: Image with large amount of noise

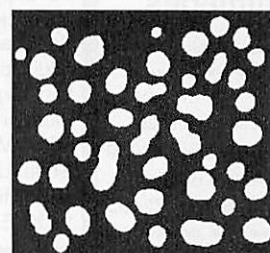


AFTER: Effect of using a median filter on the image

Images can be turned into useful information. The original image of these cells is thresholded to separate foreground from background, and each cell is then inspected. The results show where the cell is in the image, its size, and how close to a circle it is (the nearer the 'p2len' measure is to 1, the closer the shape is to a circle).



BEFORE: Thresholded image, showing how the cells have been picked out



AFTER: Measurements are made of the individual cells in the image

New software from

BRIGHT IDEAS

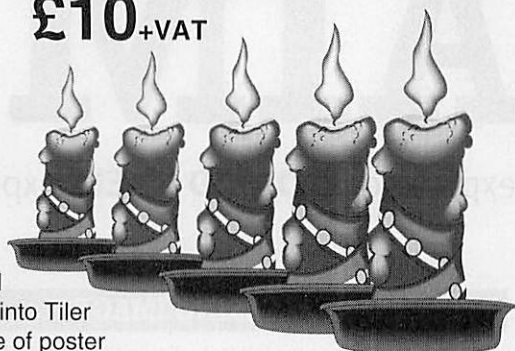
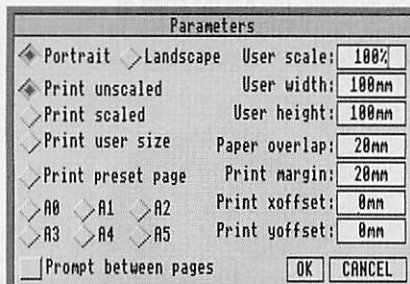
Tiler £10^{+VAT}

A printing utility which allows you to print Draw and Sprite files at any size using any type of printer.

The user simply loads the required

draw or sprite file into Tiler specifying the size of poster

required, either by using one of the preset paper size, eg. A2, A0, entering the exact dimensions of the poster eg. in millimetres or by expressing the size as a percentage of the original size. The document will then be increased or decreased in size automatically and printed when required over several pages with crop marks and references provided on each page to assist cutting/overlapping.



TopicArt

A new form of clip art comprising of single discs containing approximately 50 hand drawn high quality draw format clip art images, each on a single subject.



TopicArt1 - General

£8

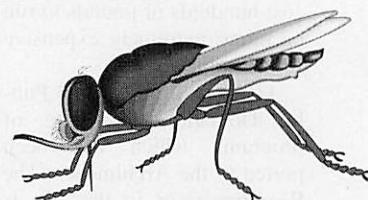
+VAT
per disc.

TopicArt2 - Transport

TopicArt4
Entertainment

5 TopicArt subjects are available now. Please specify when ordering.

Buy 4
TopicArt
discs get
one free

TopicArt3
Costumes

TopicArt5 - Bugs to Slugs

Hardware & Books (All prices exclude VAT)

A5000

A5000 4Mb RAM £1499

40Mb HD & MultiScan Monitor

A5000 4Mb RAM £1529

LEARNING CURVE SYSTEM with Multi Scan Monitor, Acorn DTP, 1st Word+, Genesis+, PC Emulator, Pacmania, introductory video etc.

A5000 4Mb RAM £1759

LEARNING CRV PRINTER SYSTEM Including Acorn JP-150 Ink Jet Printer

A3000

BBC A3000 2Mb £599

As above with Monitor £799

BBC A3000 2Mb £639

LEARNING CURVE with 1st Word+, Genesis+, PC Emulator, Pacmania, introductory video etc.

As above with Monitor £829

BBC A3000 2Mb £1089

LEARNING CRV PRINTER SYSTEM Including Acorn JP-150 Ink Jet Printer

BBC A3000 2Mb £679

SPECIAL ACCESS

As above with Monitor £879

Archimedes

A410/1 Base Machine £729

1Mb RAM & Floppy Disc Drive

A410/1 £859

With 2Mb RAM & 20Mb HardDisc

A420/1 Learning Curve £939

With 2Mb RAM & 20Mb HardDisc

A540 ARM3, 8Mb £2495

A400 Archimedes while stocks last

RAM Upgrades

A3000

Up to 2Mb RAM £55

Up to 4Mb RAM £156

A5000

Up to 4Mb RAM £129

A400

1Mb RAM £39

2Mb RAM £75

3Mb RAM £105

Up to 8Mb £649

A540 4Mb RAM Card £399

Upgrades

5.25" Disc Buffer £35

ARM3 £195

Concept Keyboards £Call

Dust cover (2 piece) £12

Econet Module £46

FaxPack (CC) £289

Graphics Enhancer £169

Hawk V9 Video Dig £199

I/O Expansion Card £79

Joystick Interface £25

Keyboard Extender £8

Midi Upgrade to I/O £27

Midi Expansion Card £65

Monitor Stand A3000 £29

Micro Mouse (Clares) £29

Serial Upgrade A3000 £19

User/Midi Card A3000 £46

VIDC Enhancer £29

Printers

Canon BJ-10ex £209

Canon BJ-300 £359

Canon BJ-330 £409

Citizen Swift 24e £235

HP DeskJet 500 £329

HP DeskJet 500C £549

Panasonic KXP-1123 £159

Star LC-20 £115

Star LC-200 £159

Star LC24-200 £179

LaserDirect (Qume) £859

LaserDirect HiRes4 £999

LaserDirect HiRes8 £1319

LD HiRes4 board £399

Ribbons/Toner

BJ-10ex Ink Cartridge £15

BJ-300 Ink Cartridge £10

LBP-4 Toner £65

Swift24 Mono £4

Swift24 Colour £15

Scanners

Scanlight Junior £129

Scanlight Jnr 256 £199

Scanlight A4 £289

Scanlight Professional £849

Monitors

Acorn Colour £199

Philips CM8833 II £199

Taxan MultiVision 775 £389

Taxan 795A £439

Taxan Viking II £749

Books (No VAT)

Dabs Archi Assembly Lang.....£14.95

Dabs Archi First Steps.....£9.95

Dabs Archi Operating System.....£14.95

Dabs Budget DTP.....£14.95

Dabs C: A Dabhand Guide.....£14.95

A3000 Technical Guide.....£29.95

A540/A5000 Tech Guide (ea).....£65.00

Acorn DTP Adv User Guide.....£14.95

Basic V: A Dabhand Guide.....£9.95

BBC Basic Guide (Acorn).....£19.95

RISCOS PRM's.....£79.00

RISCOS Style Guide.....£9.95

1st Word+ Manual (Acorn).....£10.00

Acorn DTP Manual (Acorn).....£10.00

AASM Manual (Acorn).....£25.00

ANSI C v4 Manual (Acorn).....£25.00

0% Finance (Inc VAT)

A5000LC System £1799

£179 Deposit plus 12 monthly instalments of £135

A5000LC Printer Sys £2075

£215 Deposit plus 12 monthly instalments of £155

A3000LC System £999

£99 Deposit plus 12 monthly instalments of £75

A3000LC Printer Sys £1275

£135 Deposit plus 12 monthly instalments of £95

Ordering by Telephone

When placing your order please have your credit/debit card ready. We will require the cardholders name, address, delivery address if different and the expiry date of the card.

Ordering by Post

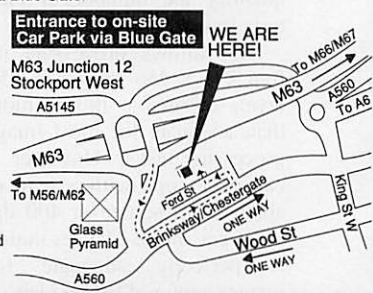
Please specify the goods you require and for which computer in writing including your telephone number & delivery address. Send complete with a signed cheque/postal order or alternatively for credit/debit cards, the card number, cardholders name, address, and expiry date. IMPORTANT - Please write your name, address & credit card details in BLOCK CAPITALS to avoid confusion.

Where to Find Us

From the M63 Junction 12 roundabout follow signs to Cheadle A560 passing the glass pyramid. At the traffic lights nr Ye Olde Woolpack Inn turn left onto Brinksway. Turn next left onto Chester St and immediately left again onto Ford St. Enter on-site car park via Blue Gate.

Terms

UK residents add 17.5% VAT to all prices except books. Carriage is free (except books, paper & large software applications) on mainland UK, elsewhere at cost. Prices and manufacturers specifications subject to change without notification. Goods offered subject to being unsold and/or available. Goods not offered on trial basis. Restocking fee on non-defective returns.



Desktop Projects Ltd

Authorised Acorn Dealer

Unit 2A, Heapriding Business Park, Ford St, Stockport, Cheshire. SK3 0BT

dtp

MegaUtils

£10_{+VAT}

A set of RISCOS utilities providing a whole host of genuinely useful, time-saving functions for all users alike, all at the touch of a button. The disc includes;

!AddrBook An easy to use address book to store all your names & adds.

!Diary A place to store all those important birthdays & anniversaries etc.

!CleanUp A hot key utility for instantly redrawing window(s).

!Disable Prevents you from deleting any file whilst enabled.

!DOSForm A multi-tasking DOS 720k formatter with verify.

!FileMon Displays all the information related to any file.

!LineClock A desktop clock that can be placed anywhere.

!MegaUtils provides a window organiser for arranging filer and/or application windows on the desktop, key short-cuts to open/close filer windows, set copy and wipe options, set filetypes, quick loading of basic programs, caret flasher, selection of mouse speed, automatic opening of application directories without using shift, mouse hider, caret grabbing.

!QuickMode An alternative to the Palette utility which allows you to select modes quickly from a user-defineable list.

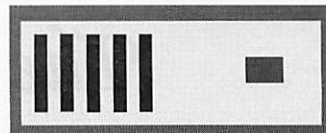
!QuickRun A user-defineable application loader.

!ScrGrab Allows you to save the screen display to a Sprite.



Hard Discs

All our HardDiscs come completely formatted and tested before despatch and also include a free copy of our Bright Ideas Utilities installed on the HardDisc.



IDE

The following are complete HardDisc Systems comprising of an IDE disc controller, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal

40Mb 17ms	£229
80Mb 17ms Cache	£315
125Mb 18ms Cache	£399
180Mb 18ms Cache	£449
330Mb 12ms Cache	£799
520Mb 12ms Cache	£999

A3000 External

40Mb 17ms	£315
80Mb 17ms Cache	£399
125Mb 18ms Cache	£485
180Mb 18ms Cache	£535
330Mb 12ms Cache	£885
520Mb 12ms Cache	£1089

A3000 Internal Hard Cards

20Mb	£199
40Mb	£495
80Mb	£695

SCSI

The following are complete SCSI HardDisc Systems comprising of a Morley SCSI interface, HardDisc, mounting brackets, cables, utilities disc and manual.

Archimedes Internal

50Mb 17ms Cache	£339
105Mb 18ms Cache	£429
180Mb 18ms Cache	£599
330Mb 12ms Cache	£899
520Mb 12ms Cache	£1049

A3000/A300/A400 External

50Mb 17ms Cache	£379
105Mb 18ms Cache	£509
180Mb 18ms Cache	£699
330Mb 12ms Cache	£979
520Mb 12ms Cache	£1149

External drives are housed in slimline colour co-ordinated case complete with integral power supply and fan. Internal Hard cards are RISC Developments units.

Archimedes, A3000, A5000 Software

Applications

3D Construction Kit (Domark) ...£45	Investigator v2 (Serial Port) ...£22
ABC Compiler (Oak) ...£77	ISO Pascal Rel.2 (Acorn) ...£83
Alphabase (Clares) ...£97	Kiddick (Oak Sol.) ...£83
Ancestry (Minerva) ...£59	Mailshot (Minerva) ...£29
ANSI C v.3 (Acorn) ...£125	MasterFile II (Beebug) ...£20
Arc DFS (Dabs) ...£22	Microstudio (EMR) ...£80
ArcComm 2 (Logotron) ...£32	Mogul (Ace) ...£15
ArcLight (Ace) ...£40	Multi FS (Arxe Systems) ...£27
ArcTerm 7 (Serial Port) ...£62	Multistore v2 (Minerva) ...£219
Articulate (4D) ...£18	Notate (Longman) ...£55
Artist (4D) ...£18	Office tools (Silicon) ...£276
Accounts Manager (Kendal) ...£295	Ovation (Beebug) ...£95
Armadeus (Clares) ...£59	PC Access (Minerva) ...£29
Artisan 2 (Clares) ...£43	PCB (Oak) ...£149
Art Works (CC) ...£Cali	PC Emulator V 1.7 (Acorn) ...£179
Atelier (Minerva) ...£73	PipeDream 4 (Colton) ...£179
Autosketch v2 (Autodesk) ...£65	Poster (4Mation) ...£76
Chameleon (4Mation) ...£24	Presentation System (Silicon) ...£61
Compression (CC) ...£42	Presenter 2 Hotlink (Linguinity) ...£33
Control Panel (Linguinity) ...£14	Presenter GTI (Ling) ...£66
DataVision (Silicon) ...£110	Printer JX, PJ, CA (ACE) ...£13
Desktop Assembler (Acorn) ...£125	Pro Artisan (Clares) ...£75
Desktop C (Acorn) ...£185	Realtime Solids Modeller (Sil) ...£132
Desktop Office (Minerva) ...£95	Render Bender v2 (Clares) ...£99
Desktop Publisher (Acorn) ...£125	Reporter (Minerva) ...£29
Easiword (Minerva) ...£29	Revelation II (Logotron) ...£110
Easy Writer (Icon Tech) ...£126	Rhapsody v2 (Clares) ...£45
Equator (CC) ...£39	RISCbase (Silicon) ...£112
Euclid 2 (Ace) ...£50	RISCType (CIS) ...£16
Eureka (Longman) ...£109	Schema (Clares) ...£96
Film-Maker (Silicon) ...£71	SigmaSheet (Minerva) ...£38
Financial Accountant (Silicon) ...£203	ShapeFX (Datastore) ...£9
First Word Plus v2 (Acorn) ...£67	ShowPage (CC) ...£130
Flexifile Database (Minerva) ...£109	Shapel (4Mation) ...£54
Flying-Start II (Mitre) ...£86	SmArtFilter (4Mation) ...£34
Font FX (DataStore) ...£9	Snippet (4Mation) ...£26
Font Starter Pack (Acorn) ...£35	Solid CAD (Sil Vis) ...£115
Gammplot (Minerva) ...£36	Solid Tools (Silicon) ...£269
Genesis 2 (Oak Solutions) ...£109	Speech! (Superior) ...£15
Graphbox v2 (Minerva) ...£57	Splice (Ace) ...£22
Graphbox Pro (Minerva) ...£109	Squirrel Database (Dig Serv) ...£129
Hard Disc Companion II(Beebug) £45	Super-Dump (Silicon) ...£21
Hearsay II (Beebug) ...£58	Super-Plot (Silicon) ...£28
HelixBasic (CCS) ...£75	Studio 24+ (EMR) ...£150
Hotlink Presenter (Linguinity) ...£41	Toolkit Plus (Clares) ...£36
Home Accounts (Minerva) ...£34	Tracer (Mid Gra) ...£46
Illusionist (Clares) ...£76	Tracker (Serial Port) ...£37
Impression v2 (CC) ...£125	Turbo Type (CIS) ...£20
Impression Junior (CC) ...£75	Tween (Ace) ...£22
Impression Bus Supp (CC) ...£39	Twoen (Acorn) ...£24
Inter-Chart (CC) ...£20	Vox Box (Clares) ...£47
Inter-Sheet II (CC) ...£30	Worra CAD (Oak) ...£83
Inter-Word (CC) ...£30	Worra Plot (Oak) ...£24

Games

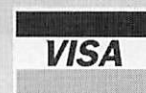
Aggressor (Atomic) ...£18	Lemmings (Krisalis) ...£19
Air Supremacy (Superior) ...£20	Loopz (Audiogenic) ...£18
Alien Invasion (Dabs) ...£14	Maddingly Hall (Minerva) ...£13
All-in-Boxing (Dabs) ...£14	Mad Prof Mariarty (Krisalis) ...£15
Apocalypse (4D) ...£14	Mag Scrolls Collection 1 ...£26
Arcade Soccer (4D) ...£15	Mal-Jong Patience(CIS) ...£15
Ballarena (Eterna) ...£14	Man at Arms (4D) ...£19
Bambuzle (Arxe Systems) ...£19	Man United Europe (Krisalis) ...£19
Battle Tank (Minerva) ...£13	Master Break (Superior) ...£15
Blaston (Eterna) ...£15	Memory Magic (CIS) ...£14
Blitz (Arxe Systems) ...£21	Micro Drive 3D Golf (CIS) ...£15
Blowpipe (Eclipse) ...£15	Micro Drive USA Cou (CIS) ...£14
Bobby Blockhead (Atomic) ...£18	MIG 29 Sup Ful (Domark) ...£32
Boogey Buggy (4D) ...£17	Minotaur (Minerva) ...£14
Break 147 & Superpool (4D) ...£17	Missile Control (Minerva) ...£14
Bubble Fair (Eterna) ...£14	Nevron (4D) ...£15
Bug Hunt, MoonDash (Min) ...£13	Orion (Minerva) ...£14
Bug Hunt in Space (Minerva) ...£13	Pacmania (Domark) ...£17
Cartoon Line (Eterna) ...£21	Pandora's Box (4D) ...£19
Casino (Minerva) ...£18	PipeMania (Ent. Int.) ...£19
Cataclysm (4D) ...£19	Poizone (Eterna) ...£14
Caverns (Minerva) ...£14	Powerband (4D) ...£18
Chequered Flag (CIS) ...£19	Pysanki (4D) ...£15
Chess 3D (Micro Power) ...£14	Quazer (4D) ...£13
Chocks Away 2 (4D) ...£17	Redshift (Minerva) ...£14
Chocks Away Extra Miss(4D) ...£14	Repton 3 (Superior) ...£15
Chocks 2 Compendium (4D) ...£27	Rockfall (Eterna) ...£16
Chopper Force (4D) ...£18	Rotor (Arcana) ...£19
Chuck Rock (Krisalis) ...£19	Real McCoy 1/2 (4D) (ea.) ...£21
Conqueror (Superior) ...£18	Saloon Cars (4D) ...£18
Crisis (CIS) ...£15	Sporting Triangles (CDS) ...£19
Drop Ship (4D) ...£14	Spitfire Fury (4D) ...£18
Elite (Hybrid) ...£33	Superior Golf (Superior) ...£15
Enter the Realm (4D) ...£18	Sup Extra Courses (Superior) ...£14
E-Type Compendium (4D) ...£19	Tactic (Eterna) ...£15
Exotic Adv of Sylvia Lain (4D) ...£19	Talisman (Minerva) ...£12
Family Favourites (Minerva) ...£15	The Olympics (4D) ...£15
Fine Racer (Eterna) ...£14	ThunderMonk (Minerva) ...£14
Fire Ball Xtra (CIS) ...£12	The Wimp Game (4D) ...£15
Flight Sim Toolkit (Simis) ...£35	Top Banana (HEX) ...£19
Freddys Folly (Minerva) ...£13	Tower Of Babel (Cygnus) ...£18
Grievous Bodily 'ARM (4D) ...£19	Trivial Pursuit (Domark) ...£22
Gumshoes (4D) ...£20	Twin World (Cygnus) ...£14
HoverBot (Minerva) ...£13	U.I.M. (4D) ...£23
Holed Out Compendium (4D) ...£18	White Magic 1/2 (4D) each ...£15
Hostages (Superior) ...£14	Wonderland (Virgin) ...£26
Ibix the Viking (Minerva) ...£14	World Ch. Boxing Man'r (Kris) ...£20
Inertia (4D) ...£14	Worra Battle (Oak Solutions) ...£15
Interdictor 2 (Clares) ...£26	X-FIRE (4D) ...£19
Iron Lord (Cygnus) ...£14	Zarch (Superior) ...£15
J. Khan Squash (Krisalis) ...£19	Zelanites (Micro Power) ...£18
James Pond (Krisalis) ...£19	
Jet Fighter (Minerva) ...£13	

Education

Adv. Playground 5+ (Storm) ...£17	Amazing Ollie 4+ (Storm) ...£14
Coffe 9+ (Storm) ...£28	Concept Designer (Logotron) ...£23
Converta-Key ...£15	Crossword- 8+ ...£19
Data Word (Triple R) ...£15	Desktop Folio (ESM) ...£82
Farmer Giles 2 (CTS) ...£17	First Words & Pictures (Chk) ...£26
Flight Path 9+ (Storm) ...£28	Freddy Teddy (Topologika) ...£19
Freddy Teddy's Adv (Topol.) ...£17	Fun & Games 5-9 ...£18
Fun School 2 (Database) ...£15	Fun School 3 (Database) ...£18
(Please specify age group) ...£17	Giant Killer (Topologika) ...£17
History Costum Pk (Mic St) ...£17	House of Numbers (Chalk) ...£19
Hyperbook Reader (Logotron) ...£48	Hyperbook Lib (Logotron) ...£110
Junior Database (Iota) ...£40	Letters and Pictures (Chalk) ...£18
Logo (Logotron) ...£60	Maple (Logotron) ...£49
Maps & Landsc. 1/2 (Chk) ea. ...£19	Money Matters (Triple R) ...£20
Numbers and Pictures (Chalk) ...£18	Numerator (Logotron) ...£60
Numerator Chaos (Logotron) ...£19	Ollie Octopus Sk Pad (Storm) ...£14
Pendown (Logotron) ...£50	Pendown Fonts (Logotron) ...£17
PIPP (CIS) ...£30	Picture Book (Triple R) ...£20
Pirate Junior (Logotron) ...£24	Pin Point (Logotron) ...£95
Prime Art (Minerva) ...£69	Robo Logo (Sil Vis) ...£70
Puncman 1-2-3-4-5-7 (Chalk) ea. ...£18	Search & Rescue 9+ ...£28
Reversals (Chalk) ...£18	Spellbook 4-9 (Soft Stuff (SS)) ...£19
Robo Logo (Sil Vis) ...£70	Star (Logotron) ...£16
Search & Rescue 9+ ...£28	Target Maths (Triple R) ...£20
Spellbook 4-9 (Soft Stuff (SS)) ...£19	Things to do with No's (SS) ...£19
Star (Logotron) ...£16	Things to do with Words (SS) ...£19
Target Maths (Triple R) ...£20	Turtles "World Tour" ...£15
Things to do with No's (SS) ...£19	Words and Pictures (Chalk) ...£18
Things to do with Words (SS) ...£19	World Scape (Eclipse) ...£15
Turtles "World Tour" ...£15	
Words and Pictures (Chalk) ...£18	
World Scape (Eclipse) ...£15	

Please contact us if you are offered a better price elsewhere, we will do our best to match it.
We operate the Acorn Teachers Scheme & 0% Finance Schemes
This advert was produced using Impression & Draw!

Tel: 061-474 0778



The smArt Suite

All 4Mation packages for the Archimedes carry a FREE SITE LICENCE.

smArt SmArt is a Linked Graphics System. When picture files are loaded into smArt, different parts of the picture can be changed by making selections from a menu. The graphics components are automatically scaled so that the parts always fit. Pictures may be saved as Draw files or transferred to DTP programs or any other applications which can handle Draw files.

The smArt package comes with over two dozen files on subjects ranging from shops to cars, and churches to British Isles maps. Available as separate products are discs of smArt files on specific themes such as Leisure, Heraldry, Faces, Fashion, Homes, Trees & Gardens, and Dinosaurs.

smArt £55 (NZ\$ 198) smArt discs £16 (NZ\$ 59)



For those wishing to create their own smArt files, smArtFile is an application which compiles smArt files from your source Draw files. Full instructions are provided along with lots of examples. Individual components may be scaled, rotated, and placed in front of or behind other components. Menu entries may be specified.

If it can be drawn it can be a smArt file.

smArtFile £35 (NZ\$ 129)



Chameleon is an ideal companion to smArt, and a must for anyone who needs to make quick and easy colour changes to Draw files. As well as palettes for 16 and 256 colour modes, there are options for 256 shades of grey and a RGB colour cube which provides thousands of colours. Colours may be selected from other Draw files so can be copied from one picture to another. Colours may also be changed in HSV values; Hue, Saturation and Value. Edited files may be saved as normal Draw files or as colour separations. A clever Undo and Redo facility allows virtually any number of colour changes to be cancelled and then reinstated. Zoom and Magnification facilities allow accurate editing of small areas.

Chameleon £25 (NZ\$ 95)

FREE DEMO DISC

Send us a blank disc to receive a demo copy of smArt and Chameleon. Only the save facility is missing. Poster demo also available.

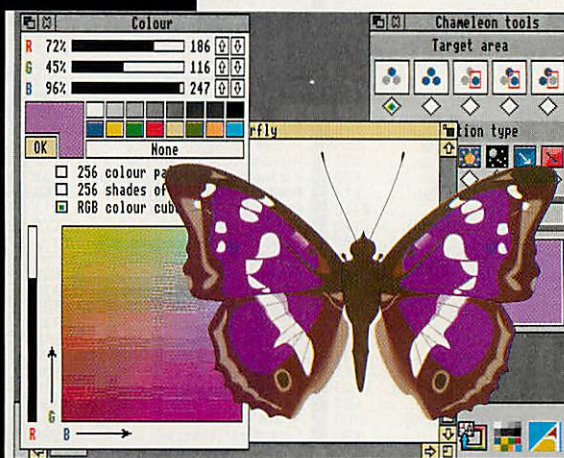
Poster	£89	NZ\$367.50
Snippet	£29	NZ\$120.00
Jigsaw	£29	NZ\$120.00
Jiglet	£29	NZ\$120.00
DTP Seeds*	£ 8.45	NZ\$ 35.00
* (book - no VAT)		

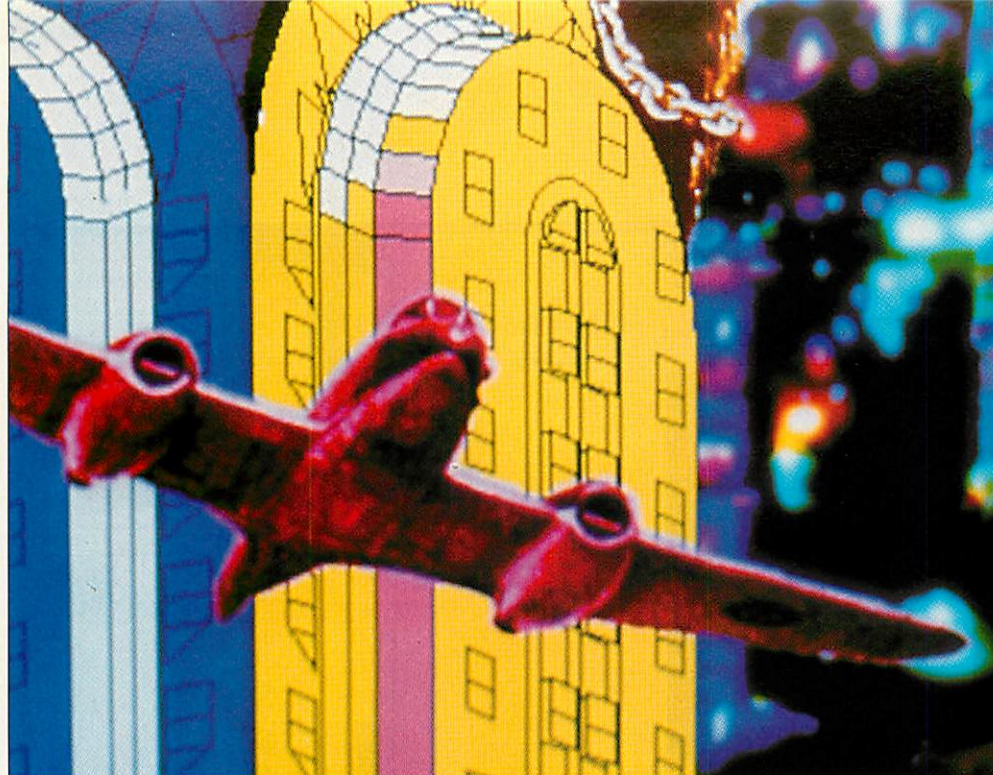
UK Prices: incl. P&P, excl. VAT @ 17½%.
NZ prices incl. GST.

4Mation • 14 Castle Park Road
Barnstaple • Devon • EX32 8PA
Tel. (0271) 25353 Fax. (0271) 22974



4Mation New Zealand
PO Box 12-228 • Christchurch
Fax. (03) 655-055





A new package allows you to design your own adventure games. **SAM GREENHILL** takes the controls

FLIGHTS OF FANCY

If you are a fan of either the *Interdictor* or *MiG-29* flight simulators for the Archimedes, then you'll be interested to know that Simis – the company responsible for both simulations – has finally made it possible for you to construct a customised flight simulator of your own. *Flight Simulator Toolkit (FST)* basically puts you in control. You decide on the scenario, the rules of the game and the mission to be accomplished.

A LOOK INSIDE

FST includes two discs plus a hefty manual in a laminated box, with four main tools for creating a simulator on one disc and example games on the other. The four tools are: a Shape editor, which allows you to design three dimensional objects; a Cockpit Designer, enabling general layout of instruments; an Aircraft Model editor, to define how the plane should behave according to its wingspan, weight, fuel capacity, general physique, and so on; and a World editor which combines the lot, defines the playing area and sorts out your enemy from your elbow.

The purpose of Shape is to create 3D objects within the simulation. The runway is an

example of a fairly flat object created in Shape, whereas the aircraft are solid objects that can be viewed from any angle.

SHAPE CREATION

Objects are created in Shape by placing points on a grid and then defining polygons by clicking on two or more points in a clockwise order. You can only ever work in two of the three axes by masking out the third. But by calling up view windows it is possible to see what the shape looks like from different angles – the software usefully highlights the polygon being worked on.

But it really is *hard*. I thought I'd start by creating a nice simple cube. Big mistake! Cubes look the same from each viewpoint, so it is best to start with something like a cuboid or even a simple house (a cuboid with a roof). However, this took me more than two hours to master.

I discovered that it is easier to set up the working window on the left of the screen, the toolbox at top right and a 3D wireframe image in a window bottom right, with the 3D image rotated 55 degrees in the X axis and 45 degrees in the Y axis. This helped me to see what was going on.

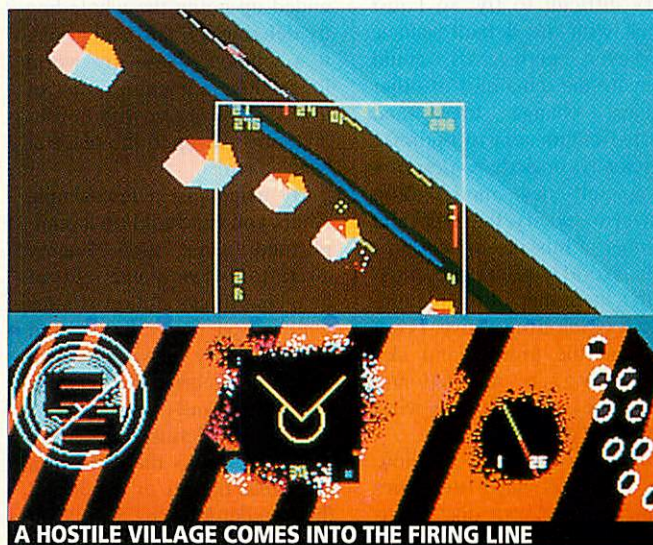
Even though you can only

deal with points and polygons in just two axes, you still have the problem of different layers. If you view a normal box from precisely above, its lid and base will appear in the same place and can be difficult to distinguish without the use of the 3D window. To overcome this problem you use the up and down arrows to step through the layers of an object – two in the case of the box (lid and base).

Colouring a polygon is very straightforward and standard operations, such as delete and move, are not badly implemented. In my review version

of *FST* there is a lack of any copy feature so that, once I'd created a window for my house and wanted to duplicate it a few times, I found that I couldn't. The final version will incorporate copy but mine doesn't – so my house ended up looking like an asylum.

It is not possible to design a cuboid by creating one side and then extruding a copy of itself out to form a solid. Come to think of it, you don't really drag anything anywhere in Shape: moving, rescaling and rotating objects is all done by typing in numbers, but unfortunately the mouse is not



used to do this interactively. Another slight oddity is the way in which polygons are created. Because only one side of a polygon is drawn by the simulator it is necessary to create some polygons in a clockwise fashion and others anti-clockwise, so as to tell Shape which side to plot. Luckily a menu option called Flip is provided to easily swap the direction if you find out you've drawn it wrongly.

DESIGNER TOOLS

The Cockpit Designer is a refreshingly easy utility. All you have to do is drag the various dials, warning lights and other bits and bobs from one window to the cockpit display where they can be shunted around to wherever you think they look best.

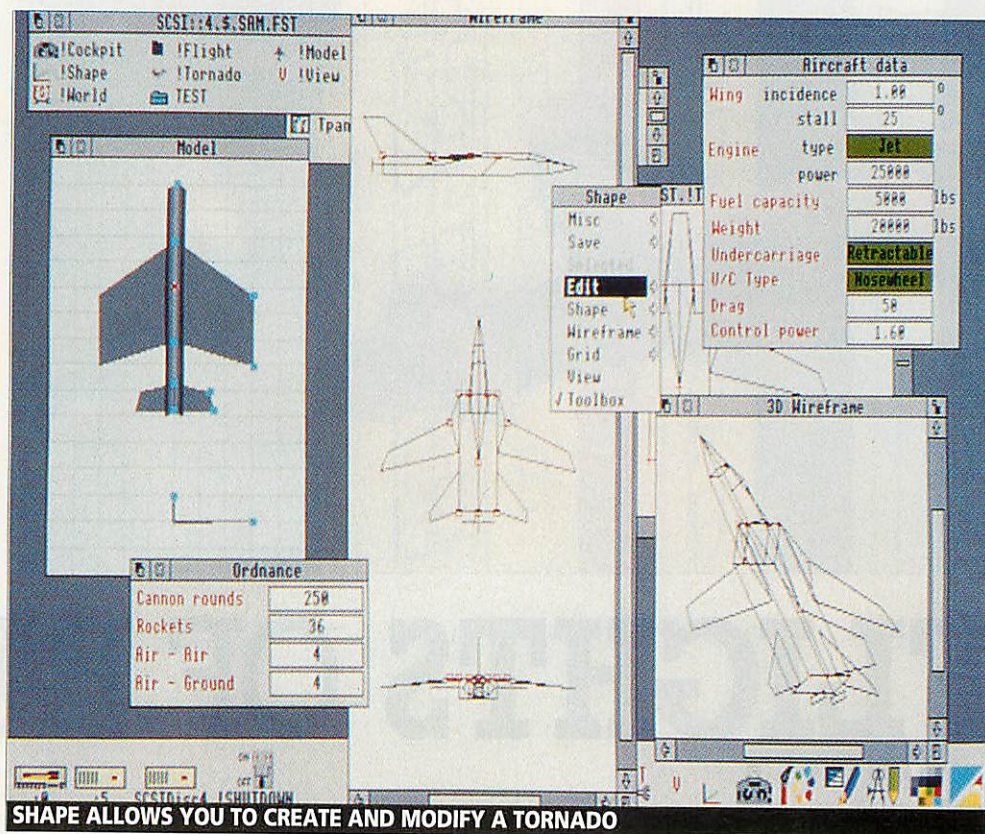
The snag is the pictorial design of the cockpit itself. Sensibly, this is left to you to design using an art package or just *Paint*, but you still need to make sure that you leave the right sized gaps for the simulator to fit things like the radar and altimeter in. The head-up-display is also defined.

Using the Model tool you can tweak the aerodynamics of your aircraft, alter the size of the engine and general modify the way in which it flies. The aircraft in one of the example games on the disc is a biplane with a propeller at the front. The weight, wing specification and engine power are all completely different to that of the other example plane, which is a Tornado.

Whenever I changed one of the factors I found the plane very difficult to fly, so I just stuck with the default values. However, enthusiasts could recreate the dynamics of other planes, change tried and trusted parameters to optimise efficiency, or perhaps design a completely new model. You can also specify the type and number of missiles to be used.

In World you are presented with a large map of the playing area looking from above. From a menu the ground and sky colours may be selected and you can even specify the wind speed and direction.

In good Risc OS fashion, you can drag shape files from a directory on your disc, on to the world grid in the places



SHAPE ALLOWS YOU TO CREATE AND MODIFY A TORNADO

you want them to appear. Once a shape exists on the map you can move, rotate or elevate it up in the sky and tell the simulator what the shape is to be.

By calling the shape a depot, other shapes called trucks will drive in and out of it. By classing it as a Sam site, it will begin to fire if you venture near and, of course, one shape needs to be labelled as the plane in which you fly.

I decided to use the design of a house with one window to be the shape allocated to the aircraft model. I tried to design a flying pig but, since my pig looked more like a house I ended up going the whole hog by deleting its 'tail' and giving it a window. Now my world looks like something out of *The Wizard of Oz*, with houses zooming all round the place at Mach Two!

By using just a few simple labels you can build up a complicated game plot. Enemy aircraft always come out of hangers, trucks follow routes which you can define and depots supply missiles to Sam sites and materials for rebuilding hangers and other depots.

You can define how many planes or trucks there are in a particular hanger or depot and the simulator keeps a tally on where they are and what

they're up to. The manual suggests that you could design trucks to look like ships, depots to look like ports and then by colouring the ground blue, hey presto, there is a new sea scenario without changing the principles. In general the documentation is well-written and informative, although not completely without fault.

World has only one thing that I found annoying. For some reason it is often infuriatingly impossible to select an object – but apart from that it is simple and effective to use.

CONCLUSION

I have mixed feelings about *Flight Simulator Toolkit*. Certainly, some things could have been better – Shape, for instance. The actual playing of the finished game has been known to cause problems. In fact many mouse users will be happy to know that pressing Ctrl-M will solve one particularly frustrating problem. The reason they cannot control the plane is because the simulator has initially assumed that it is dealing with a joystick.

Designing a whole game is a long process – you can't really avoid that, and things will inevitably go wrong along the way. I just think that the tools

could have been much more user-friendly. I would speculate that the authors are too familiar with the tools to realise that they might be quite difficult for less experienced designers to use, though this criticism is levelled mainly at Shape. My manual lacked a tutorial section but this has been promised for the production version and I think it will help considerably.

It is a pity that part of the fun is designing things like flying pigs – and that Shape does not make this particularly easy. But the main question is: does *FST* offer something that you cannot get from either *Interdictor* or *MiG-29*? Technically, no, because the concepts are the same – you shoot planes, avoid Sams and capture runways. Nonetheless, there is still a lot of fun to be had, if you can get over the initial frustration.

PRODUCT DETAILS

Product: Flight Simulator Toolkit
Supplier: Simis Ltd, 26 Chitty Walk, Keens Park, Guildford, Surrey GU3 3HW.
Tel: (0483) 233048
Price: £38.25 plus VAT
Machines: Archimedes/BBC A3000

Software Bargains and Mercury Games

Established for many years in MAIL ORDER for all Acorn computers!

Archimedes/A3000

Arcade Games

Aggressor <i>New!</i>	19.95	17.95
Bambuzle	24.95	21.95
Blitz	24.95	21.95
Bobby Blockhead <i>New!</i>	19.95	17.95
Break 147 & Superpool	24.95	22.45
Bubble Fair	19.95	15.95
Cartoon Line	24.95	19.95
Cataclysm	24.95	22.45
Chuck Rock	25.99	25.99
Elite	39.95	39.95
Grievous Bodily 'ARM	24.95	22.45
James Pond <i>New!</i>	25.99	25.99
Lemmings	25.99	25.99
Loopz <i>New!</i>	24.99	21.95
Mad Professor Mariarti	20.39	15.95
Poizone	19.95	15.95
Provocator	19.95	17.95
Rockfall	19.95	15.95
Top Banana	25.99	22.50
Twinworld	19.95	15.95
Wonderland	35.75	29.75
X-Fire <i>New!</i>	24.95	22.45
Zelanites The Onslaught	24.94	24.95

"Mind" Games

Chess 3D	19.95	19.95
Simulation Games		
3D ConstructionKit <i>New!</i>	49.99	45.95
Air Supremacy	24.95	21.95
Chocks Away Compendium	39.95	35.95
Flight Simulator Toolkit	44.95	41.95
Saloon Cars	24.95	22.45
Queched Flag	24.95	21.95

Adventure Games

Exotic Adventures .. S Lain	24.95	22.45
Enter the Realm	24.95	22.50
Legend of the Lost Temple	24.95	21.95
Pandora's Box	24.95	22.45
Tower of Babel	24.99	24.99

Sport Games

Manchester Utd Europe	25.99	25.99
Microdrive World Edition	29.95	26.95
Jahangir Khan V. Ch. Squash	25.99	21.95
World Champ. Boxing Mgr	25.53	21.95

Compendiums

Magnetic Scrolls Collection	34.99	29.95
Real McCoy	29.95	26.95
Real McCoy 2	29.95	26.95

Leisure/Various

Rhapsody 2	61.95	51.95
Score Draw	61.95	54.95
Speech	19.95	15.95
Tracker	49.95	41.95
Trivial Pursuit	30.64	25.95
Turbo Type (Typing Tutor)	24.94	21.95

Utilities

Compression <i>New!</i>	57.57	49.95
Creator	45.77	39.95
Desktop Assembler	175.08	149.95
Euclid	70.00	57.95
Graph Box Professional	151.58	129.95
Hard Disc Companion 2	52.88	47.95
Illusionist	99.95	89.95
Investigator Rel 2	27.95	23.50
PC Emulator V1.6	116.33	116.33
Pipedream 4 <i>New!</i>	230.30	204.95
Pro Artisan	105.00	81.95
Render Bender 2	135.00	114.95
Shape FX	11.75	11.75
Tracer	61.25	51.95

Word Processors

Easiwriter	176.25	149.95
Interword	34.07	28.95

Educational

Children's Graphics Pack	19.95	17.95
Coffee (9-15yrs)	32.84	29.95
Converta-Key	19.95	17.95
DataWord	19.95	17.95
Decorated Alphabet Pack	19.95	17.95
Farmer Giles	20.39	17.35
Farmer Giles 2	20.39	17.35
First Words & Pictures	25.85	21.95
Flight Path	32.84	29.95
Freddy Teddy (3-7yrs)	23.44	19.95
Freddy Teddy's Adventure	19.95	17.95
Fun School 2 0-6yrs	20.99	15.95
Fun School 2 6-8yrs	20.99	15.95
Fun School 2 8+yrs	20.99	15.95
Fun School 3 0-5yrs	24.99	21.95
Fun School 3 5-7yrs	24.99	21.95
Fun School 3 7+yrs	24.99	21.95
Giant Killer	20.39	18.35
Giant Killer Support Disc	17.88	15.95
History Costume Library	19.95	17.95
House of Numbers (6-13yrs)	25.85	21.95
Imagine	39.95	36.95
Letters & Pictures (6-8yrs)	23.50	19.95
Maps & Landscapes (9-14yrs)	25.85	21.95
Money Matters	19.95	17.95
Nature Library	19.95	17.95
Numbers/Pictures (4-6+yrs)	23.50	19.95
Ollie Octopus Sketchpad	16.39	14.95
Picture Book	19.95	17.95
Pirate <i>New!</i>	23.50	19.95
Prehistoric Animals Pack	19.95	17.95
Puncman 1&2 (7-13+)	23.50	19.95
Puncman 3&4 (8-14+)	23.50	19.95
Puncman 5, 6, & 7 (8-15+)	23.50	19.95
Revelation	89.30	89.30
Reversals	23.50	19.95
Search & Rescue (9-15yrs)	32.84	29.95
Seasame St. Number Count	19.99	17.95
Seasame St. Letters for you	19.99	17.95
Spelling Week By Wk (6-14)	25.85	21.95
Spellbook (4-9yrs)	25.50	21.95
Target Maths	19.95	17.95
TinyLogo/Tiny Draw (4-9yrs)	35.19	31.95
Tools Graphics Library	29.95	27.95
World Geography Maps Pack	29.95	27.95
World Wildlife Pack	19.95	17.95

Communications

ArcComm V2	63.45	63.45
Arcterm 7	79.95	67.95
Hearsay 2	88.13	79.35
Desktop Publishing		
Clip Art Set 1 or 2 (Each)	35.19	29.95
Impression 2	198.57	145.95
Impression Junior	105.69	81.95
Ovation	116.33	91.95

Peripherals & hardware

Arch Joystick Interface (Serial P)	28.14	26.95
Clares Micro Mouse	32.00	27.50
Graphics Enhancer	222.08	194.95
Scan-Light Junior 300/400	222.08	209.95
Scan-Light Junior A3000	233.83	209.95
Scan-Light Senior 300/400	468.83	445.95
Scan-Light Senior A3000	468.83	445.95
Sound Samp. & Midi Card	81.08	71.95

Computer Aided Design

SolidTOOLS

Instructional Videos

Up & Running	14.95	-
Text Processing	14.95	-
Data Handling	14.95	-
Art/Graphics	14.95	-

SRP SALE

19.95	17.95
32.84	29.95
19.95	17.95
19.95	17.95
19.95	17.95
20.39	17.35
20.39	17.35
25.85	21.95
32.84	29.95
23.44	19.95
19.95	17.95
20.99	15.95
20.99	15.95
20.99	15.95
24.99	21.95
24.99	21.95
24.99	21.95
20.39	18.35
17.88	15.95
19.95	17.95
25.85	21.95
39.95	36.95
23.50	19.95
25.85	21.95
19.95	17.95
19.95	17.95
23.50	19.95
16.39	14.95
19.95	17.95
23.50	19.95
19.95	17.95
23.50	19.95
23.50	19.95
23.50	19.95
89.30	89.30
23.50	19.95
32.84	29.95
19.99	17.95
19.99	17.95
25.85	21.95
25.50	21.95
19.95	17.95
35.19	31.95
29.95	27.95
29.95	27.95
19.95	17.95
63.45	63.45
79.95	67.95
88.13	79.35
35.19	29.95
198.57	145.95
105.69	81.95
116.33	91.95
28.14	26.95
32.00	27.50
222.08	194.95
222.08	209.95
233.83	209.95
468.83	445.95
468.83	445.95
81.08	71.95
375.00	317.50

(SRP = Suggested Retail Price) All prices include VAT @ 17.5%

This is only a selection of our range of software for the Arch!
Please 'phone or write for our catalogue - **IT'S ABSOLUTELY FREE!**

This month's
special offer for the Arch!

JOYSTICKS



Pack One Serial Port Interface & 1 X
Quickshot 3 Turbo £33.95
Pack Two Serial Port
Interface & 2 X Quickshot 3
Turbo £44.95



Pack Three Serial Port Interface & 1
X Superpro Atuo joystick £34.95
Pack Four Serial Port Interface
& 2 X Superpro Auto £45.95

Printers

Panasonic KX-P1081	9pin dot matrix	£159.95
Panasonic KX-P1170	9pin dot matrix	£169.95
Panasoinic 1124i	24pin dot matrix	£254.95
Seikosha 1900 AI	9pin dot matrix	£119.95
Seikosha SP2000	9pin dot matrix	£159.95
Seikosha SL92	24pin dot matrix	£249.95

Prices include VAT, cable & delivery!

(Delivery free UK mainland only, excluding Scottish Highlands)

** Full specifications available on request **

Exclusive!

Unused BBC B's

High Specification BBCs for only £176.25!

(Includes, DFS, Econet, a word Processor & Speech ROMs)

Variety of special bundle packs available to include a
BBC B & Cumana 5.25" Disc Drive from only £279.95

Please write or 'phone for further information

BBC & ELE

Send for our Catalogue! BBC/ELE B-Disc Cpt

Arcade Soccer	6.50	8.50	8.95
Colossus 4 Chess (40t)	7.95	12.25	12.25
E-Type	6.50	9.75	10.50
Elite	9.95	11.95	15.95
Emlyn Hughes Quiz - <i>New!</i> (BBC)	8.95	11.95	-
Exile	9.95	11.95	15.95
Fun School 2 (0-6 yrs)	8.95	11.95	12.50
Fun School 2 (6-8 yrs)	8.95	11.95	12.50
Fun School 2 (8+ yrs)	8.95	11.95	12.50
Fun School 3 (0-5 yrs) (BBC only)	9.95	13.95	-
Fun School 3 (5-7 yrs) (BBC only)	9.95	13.95	-
Fun School 3 (7+ yrs) (BBC only)	9.95	13.95	-
Holed Out	8.50	9.75	10.50
Holed Out Extra Crses 1	6.50	7.75	8.50
Holed Out Extra Crses 2	6.50	7.75	8.50
Loopz	8.79	11.95	-
Master Break	7.95	9.95	11.95
Micro Power Magic 1 *	5.95	6.95	7.75
Micro Power Magic 2 *	5.95	6.95	7.75
Micro Power Magic 3 *	-	6.95	-
Mini Office 2 * (BBC only)	10.95	13.95	17.95
Mini Office 2 M128 *	-	15.95	-
Nevryon	-	9.75	10.50
Play it Again Sam 1 to 10 (Each)	6.95	8.95	10.50
Play it Again Sam 11 to 14 (Each)	7.95	9.95	11.95
Play it Again Sam 15 & 16 (Each)	9.95	11.95	15.95
Q-Master <i>New!</i> (BBC Only)	-	12.95	13.95
Repton infinity	9.95	11.95	15.95
Sim City	9.95	11.95	15.95
Speech (BBC only)	7.95	9.95	11.95
Superior Collection 1 (BBC only)	6.95	8.95	10.50
Superior Collection 2 (BBC only)	6.95	8.95	10.50
Superior Collection 3 (Ele only)	6.95	-	-
Tank Attack (40t)	9.95	11.95	-
U.I.M. (Needs 16k Sideways RAM)	-	12.95	14.25
White Magic 1 or 2 (each)	6.50	9.75	10.50

(* Please state 40t or 80t disc)

Software Bargains & Mercury Games

Dept AU 32, C/O Northwood House, North Street, LEEDS LS7 2AA

TEL: 0532 436300 FAX: 0532 423289

* Access/Visa Welcome

* Please add 95p P&P (Europe £2.50, Outside Europe £4.50)

* All prices include VAT @ 17.5%

* Goods despatched within 48 hrs, (subject to availability)

* Educational discount of 30% off SRP (not Sale price) available
on most Archimedes software; Official Order No. or school
headed notepaper required - minimum order value £30.00 for
invoicing, otherwise cheque with order.

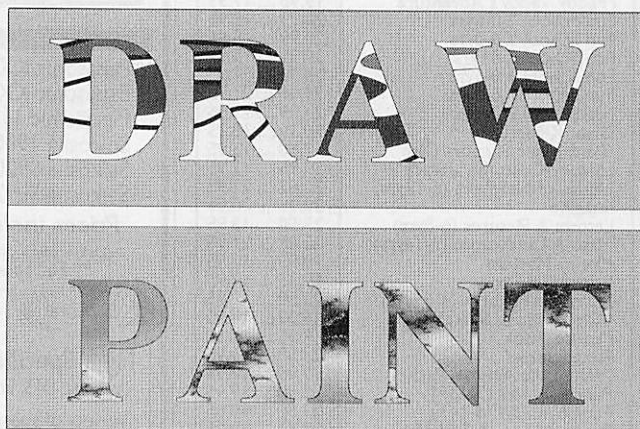
(Prices are correct at the time of going to press, E&OE)

BEND IT

ROB MILLER tries some packages which help word manipulation

One of the most useful parts of Risc OS, and what makes the Archimedes so suited to desktop publishing, is the outline font manager. Rather than being made up of dots on a grid (like traditional bitmap fonts) outline fonts, as their name suggests, are made up from outlines stored as a series of lines and curves, similar to those that you can create using *Draw*.

These outlines can be scaled in size to give letters of any size without the loss of smooth edges, both on screen and on paper. The current Risc OS 2 font manager can display outline fonts on screen at any size, although only in a straight horizontal line. For anything off the straight and narrow, these outline fonts have to be converted into



Draw path, as well as include a number of different effects, such as shadowing and rotation. Most of the concepts and terms used in *Poster* have been carried over to the newer programs. Moulds and paths both originated in this package, but now seem to be used universally to describe the stretching and bending of text. Assuming that you have a copy of *Draw* to help with post production, the effects shown here (apart from the stencil picture above) can be achieved with all the

programs we reviewed. Rather than detail each application in turn, I will first explain these effects and then go on to look at each individual package.

A summary of the various effects that each program can produce is given in the table overleaf, indicating where *Draw* is necessary. *Fontasy*, for example, requires *Draw* for producing Bezier paths for text to follow. *Type Studio*, on the other hand, has Bezier path creation built in.

SPECIAL EFFECTS

All of the programs allow text to be produced in any colour and text can be outlined with lines of a chosen colour and thickness. This is also easily

done in *Draw*. Once text has been converted into a *Draw* outline, it is simple to rotate words or individual letters to any angle. However, all of the applications allow text to be rotated in various ways before it is exported to *Draw*. Each application also allows text to be sheared, or leaned – this gives the text a sloping effect, either backwards or forwards.

SHADOWS

Creating 'interesting' headings is probably the most common reason for wanting to change the appearance of text. Placing a shadow behind text gives an effect of the text appearing to stand out from the page. These applications will allow you to produce wall (or drop) shadows and floor (or projected) shadows. Wall shadows, as their name suggests, appear behind the actual text and can be offset from the text to give an effect of different sources of light, or can be moved further away from the main text to give a greater sense of depth. Floor shadows are a similar effect to shadows created when the sun is setting, or when a light source is at a low position in relation to the object it is lighting. Although none of the programs create a

true shadow, with correct perspective, the effect is nonetheless realistic.

A kind of engraved effect can be achieved by placing a shadow behind some text and blanking out the main text itself. By using two shadows, one opposite the other, text can appear as though it is carved or etched into a surface.

BENDING

Fontasy and *Type Studio* can both allow the text to follow any path that you provide them with. This is a far more flexible system than with *FontFX* which can only draw text on a slope or around a predefined circle, arc or star shape.

The direction of text on a path depends on the position of the first point on the line forming the path. Text is usually drawn from the beginning of a line to the end, although it can be forced to the left, right or centrally justified. Text can also be made to rescale in size automatically to match the length of a particular path – a useful bonus.

HOW THEY WORK

All the programs retain the original text typed in for conversion. In each case, text must be typed directly into the

Plain Text
Outlined Text
 Hollow Text

Draw format outlines. When in *Draw*, the text can be rotated, coloured or tweaked using *Draw*'s tools and, with a good knowledge of *Draw* and some practice, some impressive effects can be achieved.

Then along came *FontFX* from The Data Store, which not only allowed you to convert text into *Draw* paths, but also added effects, such as shadows, and made the text follow a predefined path. *Poster* from 4Mation expanded on this idea so that text could follow a *Draw* path that you defined, or it could be squashed into a mould.

Now there are a number of applications which do the conversion from outline font to



program concerned, to a maximum of 256 characters. There is no option to load text from a file, although by the very nature of these programs, you will only want to input a few words at a time anyway. Once text has been entered into an

THE POSSIBILITIES

	Shadows					Paths			
	Colour	Type	Graduated	Depth	Etched	Slope	Column	Arc	Draw file
Fontasy	✓	✓		✓	(1)	✓	✓	✓	(2)
FontFX	✓	✓			(1)	✓	✓	✓	
Type Studio	✓	✓	✓	✓	(1)	✓	✓	✓	✓
Poster	✓	✓		✓	(1)	✓	✓	✓	✓
RiscOS3 Draw	✓		✓	✓	(1)				

	Scaling	Script files	Moulds	Change outline/fill colour	Rotation	Leaning
Fontasy	✓	✓		✓	✓	✓
FontFX	✓	✓		✓	✓	✓
Type Studio	✓	✓	✓	✓	(3)	✓
Poster	✓	✓	✓	✓	✓	✓
RiscOS3 Draw	✓			✓	✓	

1. Post production in Draw required.
 2. Draw must be used to create a path with more than two points.
 3. Yes, but letters must be rotated by hand.

application, it is automatically converted into an outline. The computer reads this as a series of lines and curves. Text can only be edited by typing in new text and reconvert it.

However, *Fontasy* does allow the appearance of text to be changed back to the original outline. For example, you can add a shadow to some text, place it around a circular path and then reset it back to the original outline.

None of the other applications allow you to do this without having to start anew. Another plus point for *Fontasy* is that it allows the text to be kerned easily – this is important for headlines where letters such as W and X may look

Because *Draw* is not required for paths and moulds, *Type Studio* will operate easily on a 1Mb machine.

Type Studio incorporates a mould tool – this is one step up from a path and squashes text outlines between two pre-drawn lines. Using curved lines causes text to bulge where lines are further apart, and compress where they are closer together. Offsetting the lines allows text to be sheared left or right, or even up or down. Making the lines different lengths causes text to stretch in a kind of perspective effect. With practice, the mould tool is very powerful.

One tool not present in any of the other programs is Plinth, which merely places a filled (or unfilled) rectangle behind each letter. This effect can be applied to text generated by the other programs with post processing in *Draw*. One final point is that, like *Poster*, *Type*

Studio will allow any *Draw* file to be loaded and processed. This means that any *Draw* file, not just text, can have a shadow added or can be squashed into a mould.

FONTFX

This application is very easy to use, while providing some useful effects. It does not have the true path or mould facilities of the other programs, but does have a speciality of its own, namely Stencil.

Setting the stencil option when creating a text outline, draws the outline as normal, but makes the filled part transparent. The area outside the outline is actually filled in, giving a rectangle with a

letter-shaped hole in it. An additional border is placed around each letter which can be enlarged or shrunk to cover up as much or as little of the background as required.

Any object which can be loaded into *Draw* can be placed behind a stencil. This includes *Draw* objects themselves, sprites and text areas. Amazing effects can be achieved using this method and it is quite surprising that this feature has not been included in the other applications. *FontFX* is not as flexible as the other applications but is substantially cheaper than the competition. It is certainly a good starting place for producing text effects on a small budget.

FONTASY

Text can be typed directly into *Fontasy* and it will appear instantly on the screen as an outline. From here, text can be kerned and any other effects directly applied. The ability to reset different effects to get back to a straightforward outline is very useful – it can save a lot of time if you wish to try out different ideas on the same piece of text. It is also quite useful to have *Draw* loaded at the same time as *Fontasy* to produce multi-pointed paths, although this leaves little space for any other applications in a machine with only 1Mb of Ram.

DrawBender is a program (also from ICS) that allows you to take a *Draw* file (in other words, an outline file from *Fontasy*) and stretch it into any shape, in a similar way to the moulds used in *Type Studio* and *Poster*. If you couple this with *Fontasy*, you are in theory getting virtually the same features as *Type Studio*. You will need to use *Draw* in order to create advanced paths – but since this is included with every new Archimedes or BBC A3000, that is no problem.

DrawBender is also free if you buy a site licence for *Fontasy*, which is good value for money at only £25 for a single user version. If you consider the combined cost for *Fontasy* and *DrawBender*, it stands up well to *Type Studio*, although the latter includes the outline font manager.

CONCLUSION

Of the three, *Type Studio* is the most comprehensive. All of the tools you are likely to need are included and there is no need to use any other application with it. *Fontasy* has the useful Undo facility on all its tools, which is handy when you want to experiment. Finally, *FontFX* is the only one to offer a Stencil option.

Type Studio and *FontFX* together are a good match – they share common functions, but it is their extra tools that really make the difference.

DrawBender with *Fontasy* is also a good value combination, although it requires a lot of saving and loading between programs – something that is not easy when you have a machine with little memory or no hard disc.

PRODUCT DETAILS

Product: Fontasy
Price: £25 (single user version), £80 (site licence version, including DrawBender and Placard)
Supplier: Ian Copestake Software (as below)

Product: DrawBender
Price: £15
Supplier: Ian Copestake Software, 10 Frost Drive, Wirral, Merseyside L61 4XL
Tel: 051-632 1234

Product: FontFX
Price: £9.95
Supplier: The Data Store, 6 Chatterton Road, Bromley, Kent BR2
Tel: (081 4608991)

Product: Type Studio
Price: £45
Supplier: Risc Developments Ltd, 117 Hatfield Road, St Albans, Herts AL1 4JS
Tel: (0727) 40303

Product: Poster
Price: £89
Supplier: 4Mation, 14 Castle Park Road, Barnstaple, Devon EX32 8PA
Tel: (0271) 25353

(All prices exclude VAT)

Incidentally, the headline on page 120 was created using *Type Studio*, using the mould option. It could be created equally well using *DrawBender*

Some text on a wiggly path

strange given normal spacing.

After you have applied your effects, the final result is saved as a *Draw* file. You can also save a special script file from *Fontasy* and *Type Studio* that will allow you to place the same effects on different text, without having to reiterate the procedures involved.

TYPE STUDIO

This is the only one of the applications to include line drawing tools with which to create paths. In use, it is a lot like *Draw* and should be no problem to people familiar with that program. The menus are ranged in a similar fashion and a small toolbox allows instant access to path creation.

THE DATAFILE

The Archimedes Public Domain & Shareware Library
Over 375megs of PD and Shareware on 400 discs many are archived to give you extra value for money and us the edge over the competition.
We are now a TRENDTECH corporation shareware vendor

Demonstration / Catalogue V

ICoke Can	Places a dancing coke can on the icon bar by Tom Godber.
ItemWalker	A cute lemming walks up and down the iconbar. Bryan Foley.
ILockUp	A quick and simple way to stop someone seeing your work.
INotePad	A neat desktop note pad by Andy Piper and Steve Tudway.
IRoboCop	A sound demo with a very good title screen. Author unknown.
ISpaceBall	A Bat & Ball clone with some good graphics. Andrew Caute.
ITravel	Ever wondered how far your pointer has traveled? Get this.
IClip Art	One file of exclusive Clip Art called Smokers and another called Bits with fun sprites.
IScramble Tunes	An excellent Stand alone Coco module. Fantastic music fast. 19 maestro files.

This disc contains 1445k of Public Domain software and the 350k Catalogue.

Our prices: Standard discs are only £1.10 each. Super Discs and PC Emulator discs are £1.25. (a super disc has over 1500k of archived software.) No minimum order: 2 free for every 15 discs ordered. Why not send your discs to us? Prices drop to 50p per standard disc and all others are only 75p. Price includes return postage. Minimum 10 discs.

Become a registered Datafile User.

For £5 a year you will receive our Cat/Demo disc automatically bi-monthly for a year and be entitled to 2 free discs for every 10 you order for the period of registration.

For your copy of the above Demo/Cat disc just send £1 to:
22 Duxford Drive, Aldergrove, Co. Antrim, BT29 4BG
If you send a £1 coin please tape it to a piece of card to stop it getting lost in the post.

The Datafile is now in its second year and would like to thank all its customers for their support and business.

ArcModem

A brand new 2400 baud pocket sized modem for the Archimedes/A3000

- Fully Hayes compatible
- BELL 103/212A
- CCITT V.21/V.22/V.22bis
- Protective cover
- Elegant design in compact size
- Mains or battery powered
- Intelligent power/saving circuit
- Long battery life

Comes complete with drivers for ArcTerm* versions 6 and 7

ArcModem, Mains adapter 9v battery, leads and driver software:

Only £169.00

ArcTerm 7 is a fully multitasking comms package.
Available from The Serial Port

The RTFM Joystick Interface

The interface allows up to two 9pin Commodore® or Atari® style joysticks to be connected to your Archimedes/A3000. The interface fits inside your machine, though it does not require a podule slot.

The RTFM Joystick Interface has support from 4th Dimension, Eterna, Krisalis Software, Cygnus Software Engineering, Clares Micro Supplies, Cambridge International Software and Minerva Software.

Over 40 Archimedes games currently work with the Joystick Interface, and you can even control games running under the BBC Emulator!

Only £34.95

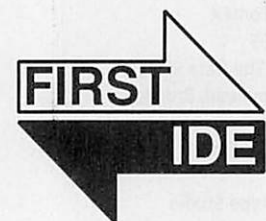


RTFM, 43 Hill Street, St Helier, Jersey.
☎ (0534) 67870, Fax (0534) 68996.



Speed Graph is a graphics card for the Archimedes. It will provide resolutions of up to 1024 x 768 pixels (or even higher) with 16 colours and 800 x 600 pixels with 256 colours. High screen refresh rates guarantee professional working. But this will not slow down the computer; in the contrary, it even will make it faster. So Speed Graph will give you two advantages, high quality graphics and - at the same time - high speed.

Available end of february



LC-SERIES

A3000 external drives including 8 bit interface, hard disc, expansion box and cables. Available while stocks last.

42 MB, 28 ms	£310	360 MB, 12 ms	£1104
104 MB, 19 ms	£448	510 MB, 12 ms	£1200
204 MB, 19 ms	£620		

Available also with external 16 bit interface or hard discs on their own. All hard disc kits are also available for the A410/A540. Please phone for details.



Are you looking for the new 1.6 MB floppies, as they are used in the A5000? So why don't you order our High Density-upgrade. It comes complete with interface, new floppy drive and the necessary software. It does not use a podule place. It is compatible with the A3000 / A310 / A410 and A540 / R260. It works with Format D/E/F and MS-DOS 1.44 MB discs. It has been tested with RISC OS 2 & 3.

Available end of february

EVOLUTION COMPUTER Ltd.
Portland Buildings, Portland Road
Aldridge, West Midlands WS9 8PP
Tel.: 44 (0) 922 / 55 128
Fax.: 44 (0) 922 / 58 126

EVOLUTION COMPUTER
Stefan Fröhling; Volmestraße 1
D - 5882 Meinerzhagen
Tel.: 49 (0) 2354 / 14 355
Fax.: 49 (0) 2354 / 14 254

We accept all major credit cards. All prices are nett, not including delivery. Please add £9 for postage and packing.



A NEW DIMENSION

Domark's 3D Construction Kit is the nearest thing yet to virtual reality on the Archimedes. **ROB MILLER** looks inside an imaginary world

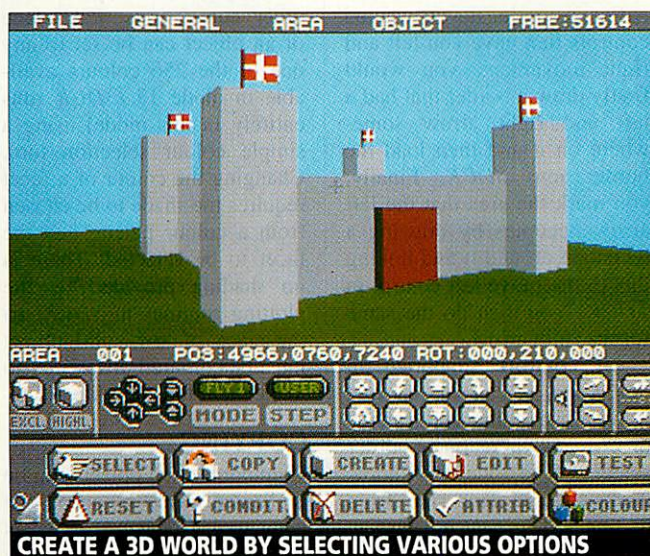
Many readers may recall that, in the heyday of the BBC Model B, games such as *Cholo* were the first step into what is now known as virtual reality.

Cholo was a three dimensional game in which the player explored a whole world through the eyes of various robots. All scenery, including buildings, trees and roads, was shown as wire frame, perspective projections. And, given a certain amount of imagination, you could actually believe you were there.

Now, since the advent of fast processing and the greatly increased graphics ability of the Archimedes, three dimensional games have started to emerge. The monochrome, wireframe graphics of old have now been replaced with full-colour, solid images. However, games that have made use of three dimensional graphics have been a bit thin on the ground up until now, with a only a handful of flight simulators plus the odd driving game on offer.

THE REMEDY

Domark plans to remedy the lack of such programs with the conversion of its *3D Construction Kit* to the Archimedes format. As the name suggests, *3D Construction Kit* allows the user to build up a world from simple building blocks,



such as cubes and pyramids. The user can interact with each scene with various tools that allow objects to be manipulated. The finished world can then be saved as a stand-alone program which can be run without the original *3DCK* program present.

Being a direct import from the PC, the Archimedes version of *3DCK* predictably does not make full use of the Risc OS window environment. Instead, it uses a system of pull-down menus, similar in use to those found on the Apple Macintosh. On loading the program, the screen blanks and, after a few moments, you are presented with a half-screen view into your world,

with a selection of tools underneath. A top menu bar provides access to all of the tools via the menus.

Unlike other 3D editors, everything you edit is displayed dynamically in solid 3D perspective – a sort of graphical WYSIWYG (What You See Is What You Get). There are no plan views or side elevations, so placing objects in line can be quite a difficult task. On the other hand, there is a grid system which allows the shapes to be positioned with a certain degree of accuracy.

Creating an object is simply a case of selecting the create tool and choosing the type of object you want to make from

a list. Two and three dimensional objects can be selected, including cubes, pyramids, rectangles and triangles. Once chosen, the object appears in the view display.

The size, position and colour of the object always starts off the same in all cases, but can be altered afterwards to suite the user's design.

NAMING OBJECTS

When a new object is created, its name (such as Cube01) is added to a list of rudimentary objects used in a scene. Having a long list of similar names (if several cubes have been created they will be named Cube01, Cube2, Cube3, and so on) can lead to confusion, so there is an option to change the attributes of the objects, including their names. Objects such as Rect01 and Rect02 could be changed to something more meaningful, such as Door and Window.

An object can be selected for editing by either choosing its name from the object list (this is where the importance of meaningful names becomes apparent) or by pointing to it in the view window. Two extra tools make identification of a selected object clearer.

Exclude isolates the chosen object and only shows that object in the view window. This is useful if the chosen object is the same colour or

close to lots of other objects, such as a panel on a car. Highlight is used to highlight the selected object by outlining it with a flashing box. Either or both tools can be toggled on or off during editing.

Once selected, an object can be moved or stretched in any x or y direction. Objects can also be rotated through steps of 90 degrees in either the x, y or z axes. Some object shapes allow individual points on an object to be selected and moved independently to the rest – for instance, regular triangles (those with three sides of equal length) can be stretched about to make any type of triangle.

MOVING EXPERIENCE

As mentioned before, everything you create is immediately displayed in 3D solid perspective. Using various controls, you can move in any direction. Rotation around the x, y and z axes is also possible allowing the player to easily change direction. All objects within your view are redrawn in real time as you move around, although the more objects there are on screen, the longer the frame update takes.

A number of different modes are provided which allow for various types of movement. Walk (the default mode) allows the player to move around in a horizontal plane and climb steps of sensible height. Gravity is fully supported, so walking off a high object causes the player to fall to the ground or next object down. Two fly options

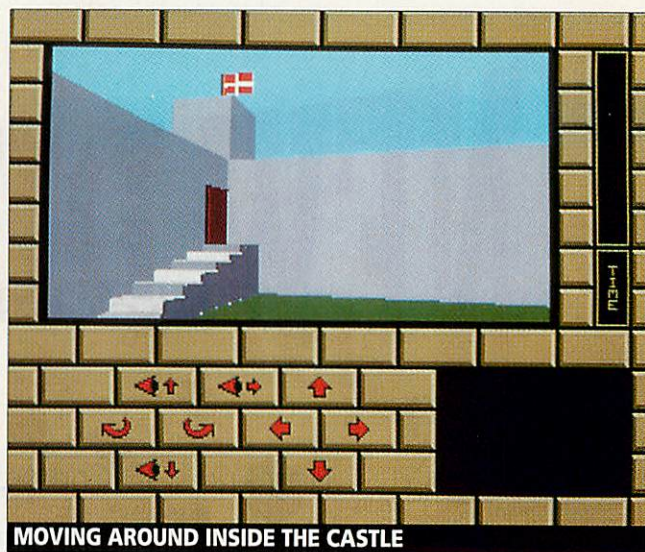
allow the player to move freely around a scene, floating from object to object as required. Bumping into any object while moving will stop the player in his or her tracks.

Cameras can be defined and set up in a scene, and moved around with complete disregard for other objects. Although visible, objects are physically transparent to cameras and will not halt movement like the other modes.

When a stand-alone game is created, all that is shown on screen is the player's point of view. Control icons (to provide movement) can be drawn in a separate art package, such as *Paint* or *Arco*, and incorporated into the finished item on a border that surrounds the view window. Such icons are linked to the game by loading the new border into *3DCK* and marking the area that each icon will use when clicked on.

For example, if you wanted controls that gave you left and right movement, you would firstly draw a border that had a left and right arrow somewhere on it and then load the border into *3DCK*. Finally, you mark the area that the left arrow occupies by drawing a rectangle around it and linking this to the move left control in *3DCK*. You then do the same for the right arrow.

All controls supported in *3DCK* can be carried over to a stand-alone game and can be placed anywhere on a border screen. The view window itself can be any size from quite small up to a full screen. In the later case, controls can be accessed by using keys on



the keyboard to simulate all of the necessary icons.

Being an import from the PC, *3DCK* is blessed with the ability to utilise a 256-colour palette, instead of the 16-colour palette usually found in other conversions. Each face of an object can be set to any one of the 256 colours available in mode 13 (*3DCK* runs entirely in this mode) using a simple colour selection tool. Changing the colour of a facet requires the shade to be chosen from a colour palette and the facet to be selected. There is no shading provided by the plotting routines in *3DCK*, so the sides of any solid object must be coloured differently to make them look solid.

COPYING

Commonly used objects can be replicated easily by using the copy tool. When an object is copied, a direction must be given in which the clone will appear. The copy tool becomes more useful when you wish to copy several objects at once. It can be useful in many situations – for instance when you build a house and want to create a street of similar houses.

Objects can be grouped and treated as a single object and each group can be moved around as a whole, although stretching or re-colouring is no longer available. Individual objects within a group can be edited fully as before.

Strangely enough, groups cannot be renamed to distinguish them from any other groups in the object list. This would have been even more useful than renaming single

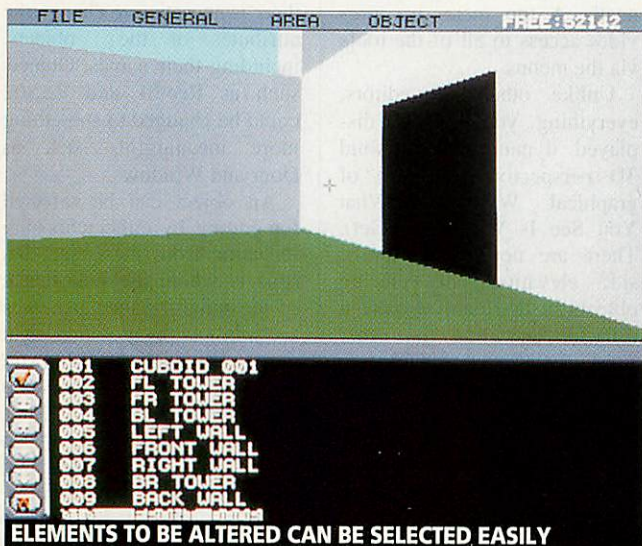
A SOUND OPTION

Like good graphics, sound can greatly enhance the overall feel of a game. So it's good news that *3DCK* allows sampled sounds to be implemented and played when selected objects are activated, shot at and so on.

Six rather boring sound effects are built in to the program, but there is also provision to include your own samples. These can be created with samplers such as *Clare's Armadeus*, or extracted from *Tracker* tunes and the like.

There is no option to change the pitch of a sample so if you want a rising tone, you would have to incorporate a number of samples at different pitches, which could be played in order. Up to 25 user samples can be added so it would be feasible to play tunes if the different notes were present.

No use is made of the *Archimedes'* stereo capabilities which is a shame, as it would have been great to pan around an area and hear the noise of an object moving around according to your position.



objects and is a notable omission. Rather than have one great expanse, *3DCK* allows you to create a number of areas which can be linked together to form your 3D world. In most cases, you will probably want to have more than one room or area in a world. For example, you may want a house which is viewable from outside, but with separate rooms inside. Areas are best thought of as different

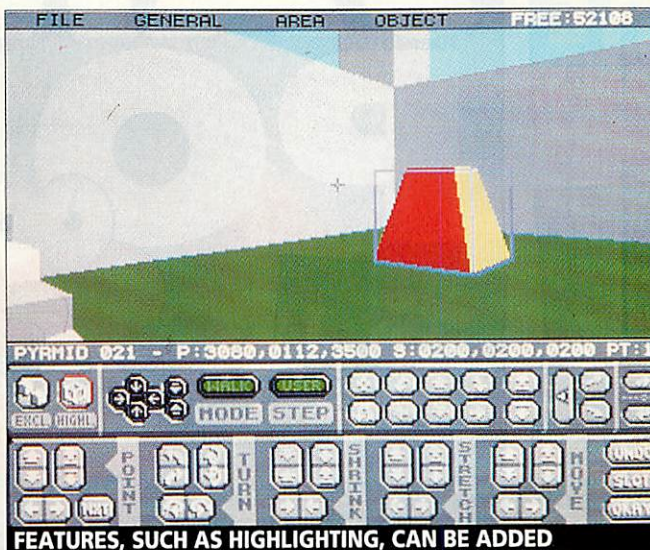
rooms in a building where you can't see from one room to another. Each area can have a number of entrance and exit points, so it is possible to have areas 'within' areas, such as a cupboard in a room in a house.

INTERACTION

One of the key features of 3DCK is its ability to interact with objects that you have created. There are three ways you can interact with objects: colliding, activating and shooting. This is done via a special programming language incorporated in the editor. If you are familiar with Basic (the language supplied with the Archimedes), you should have no problems creating the small programs that are required to control objects.

Each object that you intend to manipulate has its own associated program, which is normally quite short – typically, five to 10 lines. Most programs are written to test if a condition is true – have I bumped into this object, or has this object been activated, or perhaps shot? Programs are linked to objects by selecting the object name from the object list and creating a condition for it.

A simple program to test if the player has walked through a doorway, or rather bumped into the object that represents a doorway, may look something like this: IF COLLIDED? THEN GOTO (1,2) ENDIF which translates as – has the player bumped into the doorway object? If so, then move the player to a new area and end the condition. Of course, this



is only a very simple routine and 3DCK contains other features that can be implemented via the programming language.

Objects can be made visible or invisible, which is useful when you want to shoot at something and make it disappear. Doors can be made to open by having two different states for the door to show open and closed.

MOVE IT

Objects can not only be made to disappear, but they may also be moved around an area. Using loops in an object's control program allows it to be animated. For example, a portcullis could be made to slide up or down.

But animation is not just limited to objects – even the player can be made to move around an area on a predefined course, like riding on a train. The use of variables in a program allow various events to

be recorded, such as particular items being picked up, or how many times an object has been shot. The values held in variables can be displayed numerically or graphically on the final game screen. One typical use would be to show the score of a player or the amount of energy he or she still has.

Once you have created all the areas you require and filled them with the necessary objects, the whole lot can be merged together to create an original stand-alone game. The original 3DCK is not required in order to run the final game.

In fact, games created entirely by the user are not bound by copyright and can therefore be swapped. I'm sure it won't be very long before we see games created with 3DCK springing up all over the place, on bulletin boards and Public Domain libraries.

CONCLUSION

Because it uses none of the window side of Risc OS, but relies on its own system of menus, 3DCK can take some time to get used to. The manual is written quite clearly, although it suffers a little (as does the program itself) from being a conversion from the PC/ST/Amiga.

3DCK is not intended as a technical 3D design tool. Compared to a product such as *Euclid*, it is vastly lacking in a lot of areas. For example, there are no separate view windows for different elevations and there is no facility to zoom in and out. Also the fact that no automatic shading is implemented makes lighting

effects impossible. Although I would not class 3DCK as a serious product in a designing capacity, it might find its way into some schools on the strength of its immediate representation of objects when designing – the last thing children want to do is wait for something to happen.

What 3DCK seems ideal for is creating 3D game environments. Incentive, the company which produced 3DCK, has already come up with a number of highly acclaimed games created with the system. Perhaps now there is an editor, we might see the likes of *Driller*, *Darkside* and *Castle Master* making their way into the Archimedes games arena in the near future.

If you want to get a taste of what virtual reality is all about, then 3D Construction Kit is both reasonably priced and the best product currently available for the BBC A3000/Archimedes. In the right hands it can provide hours of fun and, theoretically at least, may help to produce some decent 3D games as well.

PRODUCT DETAILS

Product: 3D Construction Kit
Suppliers: Domark Ltd, Ferry House, 51-57 Lacy Road, London SW15 1PR.
Tel: 081-780 2222
Price: £42.55 plus VAT
Machines: BBC A3000/Archimedes

FREE - D

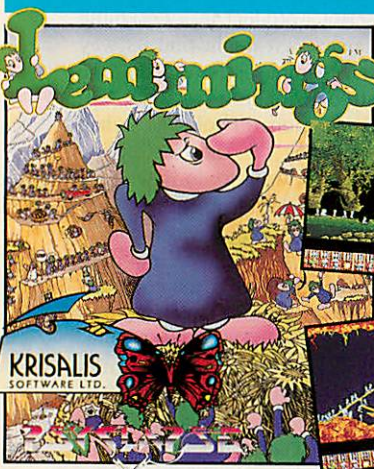
Subscribers can get a taste of what 3DCK is capable of by looking at this month's free subscriber's disc. A game created with 3DCK is supplied on the disc. All of the controls are quite obvious: clicking on the left arrow will move you left, and so on. The left-hand mouse button will fire at objects in the view window and the middle button will pick them up or activate them if possible. The two mouse buttons also have different effects on the movement controls, although these will be obvious when playing the game. Have fun!

The subscriber's disc contains many of the programs featured in each issue. For further details of how to subscribe, please turn to page 29.



AN OVERVIEW OF THE 3D SCENARIO

DBC A3000 & ARCHIMEDES SOFTWARE



Lemmings £25.99
INCLUDING VAT

KRISALIS SOFTWARE LTD.



MANCHESTER UNITED EUROPE £25.99
INCLUDING VAT

KRISALIS SOFTWARE LTD.



Lemmings £25.99
INCLUDING VAT

KRISALIS SOFTWARE LTD.

CORE DESIGN LIMITED

JAMES POND



UNDERWATER AGENT £25.99
INCLUDING VAT

KRISALIS SOFTWARE LTD.

MILLENNIUM

When danger threatens in the icy deep, when hope seems lost and the end looks nigh, there's only one fish with the guts to save the day. Now's the time to call James Pond - underwater agent. He's fearless, he's clever, he's Ozone-friendly. James Pond, the fish with a mission (twelve missions, in fact), will take on anything, from retrieving radioactive canisters and plugging the leaks in oil tankers to rescuing doomed lobsters, mermaids and rare orchids from extinction. Now you can take the part of James Pond in this all-action arcade adventure. With twelve levels and lots of secret areas to explore, brilliant graphics and game design by Chris Sorrell, this sub-sea spectacular is not to be missed! 12 momentous missions plus lots of bonus chambers. Choice of weapons or just blow up baddies with bubble action! So many different enemies and pickups you'll wish you had eight tentacles!

OTHER GREAT GAMES FROM KRISALIS

MAD PROFESSOR MARIARTI.....£19.99
MANCHESTER UNITED 1.....£25.99
JAHANGIR KHAN SQUASH.....£25.99
BOXING MANAGER.....£25.99

HOW TO ORDER

TELEPHONE

0709 372290
ACCESS & VISA ACCEPTED

RETAILERS
CONTACT OUR EXCLUSIVE DISTRIBUTOR
GREYHOUND
MARKETING LIMITED
Tel: 0532 621111

LETTER/FAX

SIMPLY SEND A LETTER GIVING DETAILS OF THE GAME(S) YOU WOULD LIKE, YOUR NAME AND ADDRESS, AND PAYMENT BY CHEQUE, POSTAL ORDER, OR BY GIVING YOUR ACCESS OR VISA CARD DETAILS INCLUDING THE EXPIRY DATE

IMMEDIATE DISPATCH

ALL ORDERS ARE DISPATCHED BY FIRST CLASS POST IMMEDIATELY. CARRIAGE IS PAID BY US IN THE UK. (ORDERS FROM OVERSEAS ADD £3 PER PRODUCT).

FULLY GUARANTEED

IF FOR ANY REASON DISKS SUPPLIED BY US BECOME FAULTY WE WILL REPLACE THEM STRAIGHT AWAY. SIMPLY RETURN THEM TO US ENCLOSING YOUR NAME AND ADDRESS.

Krisalis software Ltd, Teque House, Masons Yard, Downs Row, Moorgate, Rotherham, S60 2HD. Tel: 0709 372290 Fax: 0709 368403

TAKING NOTES

RICHARD GARRETT discovers how the Notate package can help put your musical efforts into print

If you are one of those budding musicians who likes to see the music you make, then a new music notation package from Longman Logotron could be just the ticket.

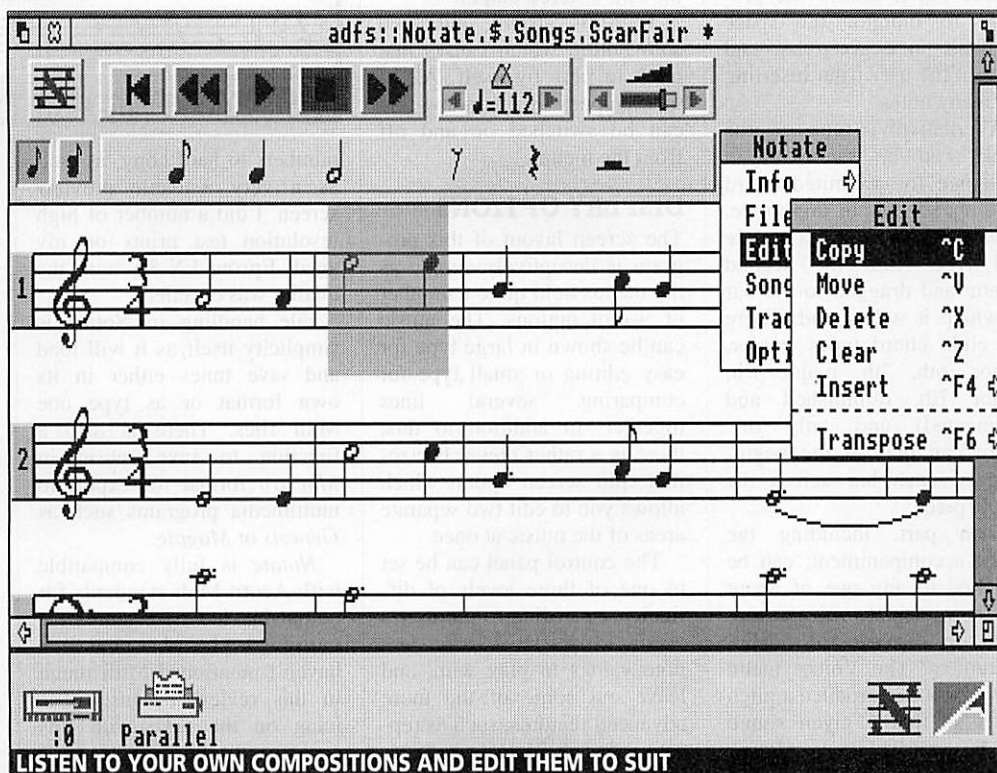
Notate is, according to the manual, a 'music composition application' – not the most precise definition I've ever heard, but there you are. Most current music software falls into one of two categories: sequencers, which 'record' sequences of notes and then play them back through synthesizers of some sort; and music printing software which allows a composer to write a complex score from the computer keyboard and then print out legible parts for whoever is going to play it.

This new package falls somewhere in between the two definitions, in that it is an eight-track, stave-based, step-input, monophonic sequencer with good print facilities. Phew! But, more importantly, it is a program that lets you hear written music.

The manual says (perhaps rather boldly) that *Notate* is suitable for users with no particular previous musical knowledge'. I found that notation was a huge obstacle to learning music and it took me about 10 years of playing before I became confident enough to know what those funny dots actually sounded like. So, it was with these misgivings that I first fired up the program disc.

GETTING STARTED

Notate comes on two discs, one containing the program and the other holding extra voices such as drum beats and saxophones. It will run on any Archimedes/BBC A3000 with 1Mb or more of memory, although 2Mb is recom-



LISTEN TO YOUR OWN COMPOSITIONS AND EDIT THEM TO SUIT

mended. Once *Notate* is installed, you can either load a file from disc, or start a new tune by selecting the N symbol from the icon bar. When you start a new tune, a window opens to display a five-line stave and a grey control panel.

It has two groups of buttons: the first comprises 'tape recorder' controls: a metronome and a volume knob which together control playback of the music. The second forms a palette of symbols (notes, rests, repeat marks, and so on) which are used during composition. Other less frequently used commands are available by pressing the menu button.

WRITING MUSIC

In *Notate*, a piece of music can be written in any key and any time signature between 2/4 and 12/4, or between 2/8 and 12/8. It will play music back in any

tempo from 30 to 250 beats per minute. Only one key and one time signature are allowed in any single tune.

The program uses up to eight note durations from a semi-quaver (sixteenth note) to a semi-breve (whole note). When the tie symbol is used, continuous notes can be formed of a length equivalent to any number of semi-quavers. Triplet notes (twelfths of a bar) are not supported, which is a shame, particularly if you happen to like British and Irish folk music.

Writing music is easy – you just drag the note value you want from the palette and, when you let it go at the appropriate point on the stave, the note plays so that you can check the pitch. If you put a note in the wrong place, you simply pick it up again and drag it to its proper position or

discard it by taking it back to the palette. The same procedure applies to inserting and editing rests (pauses) and accidentals (sharps and flats). Blocks of notes can be selected and then moved, copied, deleted or transposed by a number of semitones via the Edit menu.

To repeat a phrase, rather than copy the whole thing out again, you can use a variety of symbols to modify the structure of the tune. The simplest of these are left and right repeat marks which, when placed like brackets around it, cause a phrase to play twice.

In addition to this, you can use the following musical conventions: DC (*da capo*, or back to the top); DS (*dal segno*, or back to the squiggle); and Fine (which stops the music at fixed point before the end of a repeat).

A point to note is that there is no facility for multiple or nested repeats – the software interprets two right-hand repeat marks next to one another as an endless loop command.

MULTITRACKING

Notate supports up to eight parts or tracks, each one of which is dedicated to an individual Archimedes sound channel. This means that each track can play only one note at a time but it allows the program to monitor the space available in a given bar and prevent the user from inserting too many notes.

Alternatively, four of the tracks can be sacrificed in exchange for a limited chord accompaniment. In this mode, a chord is selected by root note and type from the second palette and dragged to the bar in which it will sound. There are eight chord types (major, minor, 6th, 7th, major 7th, minor 7th, diminished and augmented) and only one chord can play at the beginning of each bar across the whole piece.

Each part, including the chord accompaniment, can be assigned to any one of about 70 instrumental voices supplied on disc or to a Midi instrument. The Voices menu allows you to introduce a pitch offset so that a given sound can be heard higher or lower than it is written on the staff.

Chords are shown by the usual letter symbols and monophonic parts can be displayed in treble or bass clef or as a single line for untuned percussion. One really neat feature of *Notate* is that when

you copy a phrase between treble and bass parts, it is automatically transposed by two octaves to compensate.

The program does not use notation to control the loudness of the instruments relative to one another (dynamics) but consigns these functions to what looks like a neat mixing desk. Each channel is assigned a slider which controls its volume and a rotary 'pan pot' which positions the sound in the Arc's stereo output.

There is also a numbered solo button which causes that track to play by itself. All of this happens in a window that can be switched on and off from the menu.

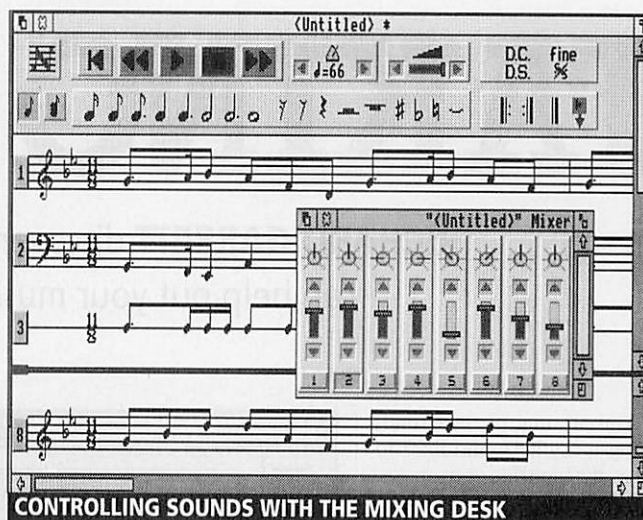
DISPLAY OPTIONS

The screen layout of this program is deceptively simple as the menus hold quite a number of useful options. The music can be shown in large type for easy editing or small type for comparing several lines together. In addition to this, there is a rather clever horizontal split screen option which allows you to edit two separate areas of the music at once.

The control panel can be set to one of three levels of difficulty, according to the user's needs. Lower levels offer less note values to play with, and leave out some of the more advanced features, such as repeat marks, accidentals and ties.

PRINTING

Notate does all its printing via Risc OS drivers and has three print sizes in both portrait and landscape. There are a number of options that add the title of the piece, page, track and bar



CONTROLLING SOUNDS WITH THE MIXING DESK

numbers to hard copy, as well as a very readable preview screen. I did a number of high resolution test prints on my aged Epson FX-80 and the quality was excellent.

File handling in *Notate* is simplicity itself as it will load and save tunes either in its own format or as type one Midi files. There is also a function to save music in *Maestro* format for export to multimedia programs such as *Genesis* or *Magpie*.

Notate is fully compatible with Acorn Midi standards for output but has no features for music keyboard input. I haven't mentioned Midi much in this review because it is icing on the cake with this package. It works very well with Midi but can be used just as easily connected to headphones or a domestic hi-fi.

CONCLUSION

I like this package a lot. It combines a simple, uncluttered display with good sound samples and print facilities to produce something that is very 'clean' and comfortable to use. The authors have paid such rigorous attention to both Acorn and musical conventions that operating instructions are almost irrelevant and, as if that wasn't enough, they have supported it with one of the best written manuals I've seen for some time.

The program is so easy to use that relating notes on the page to the sound you hear becomes automatic. The documentation says that *Notate* is for use in schools at National Curriculum Key Stages two-four upwards. I would recom-

mend it to anyone, at home or in school, who wishes to develop their understanding of written music or to experiment with sequencing from the perspective of notation. It saves a lot of initial expenditure on Midi gear.

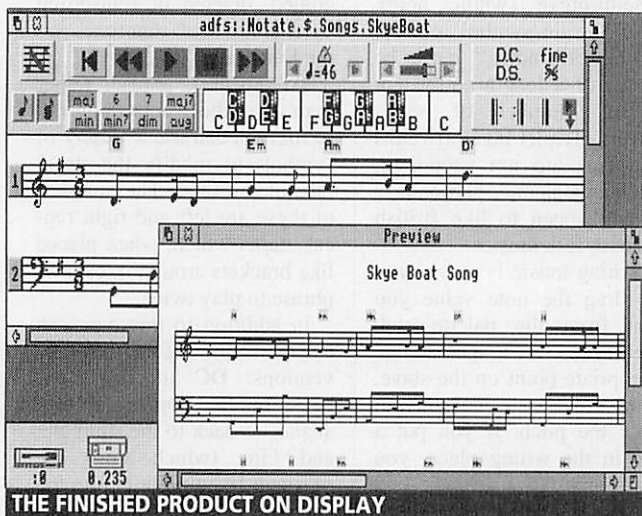
My only complaint about this package is that it doesn't quite do everything I want. Of course, music is as complicated as you want to make it and the software needs of composers expand to fill the space available, but there are three extra features I could really use – triplets, multiple time signatures for short bars and polyrhythms – and some method of writing dynamic changes into the song file (automated mixing perhaps).

That much said, *Notate* is a well-designed, powerful application and with a few more features it could be amazing. Apart from being suitable for those who have no 'particular previous musical knowledge', it is also fun. To use dots, one must hear notes and *Notate* allows you to hear those notes as you write.

I wish it had been around when I was twelve and starting to get into music – it would have made life a lot easier!

PRODUCT DETAILS

Product: *Notate*
 Supplier: Longman Logotron,
 124 Cambridge Science Park,
 Milton Road, Cambridge,
 CB4 4ZS
 Tel: (0223) 425558
 Price: £59 plus VAT
 Machines: Archimedes, BBC
 A3000 with 1Mb (2Mb
 recommended)



THE FINISHED PRODUCT ON DISPLAY

SEN LAC Computing Limited

Accounts

Home Accounts.....	35.00
Accounts Manager.....	351.32
Art/Graphics	
Artist.....	19.00
Chameleon.....	23.95
smArt.....	54.00
smArt Filter.....	38.00
smArt Discs.....	17.50
Artisan 2.....	54.00
Illusionist.....	85.00
Revelation.....	81.00
lTracer.....	57.00

Clip Art	
Ethnic Borders.....	9.95
Graph. Fact., Vols 1-5.....	26.95
Mid. Graph. Draw 1 & 2.....	34.00
Micro Studio Packs.....	20.00
.....and.....	31.00
Southern Printers Art 1.....	6.00
Communications	
ArcTerm 7.....	70.00
ArcComm 2.....	55.00

SALE!

Limited stocks!	
Financial Accountant.....	150.00
Flexifile.....	110.00
Genesis 2.....	115.00
Pipedream 3.....	128.00
Revelation.....	75.00
Tracer.....	45.00
Midnight Graph. Art 1.....	29.00

DTP/WP

Poster.....	87.00
Impression 2.....	150.00
Impression Bus. Supp.....	52.00
Impression Junior.....	81.00
Desktop Folio.....	94.00
EasiWriter.....	145.00
Protext.....	132.00
Pendown Outline Fonts.....	19.95

Databases

Pinpoint.....	99.00
Flexifile.....	133.00
Multistore v2.....	255.00

VAT Reg. No. 508 7594 16

Design	
Einstein.....	135.00
Euclid v2.....	58.50
Worra CAD.....	98.00
Education	
Jiglet.....	31.00
Jigsaw.....	31.00
Expansion	
Graphics Enhancer.....	215.00
Hypermedia	
Genesis 2.....	130.00
Magpie.....	56.00
Music	
Rhapsody 2.....	55.00
Score Draw.....	55.00
VoxBox.....	55.00
Oak Recorder.....	31.00
MIDI Tracker.....	14.00
MIDI/Sampler (Econet).....	75.00
MIDI Interface (S.Port).....	43.00
Peripherals	
ScanLight Junior.....	145.00
ScanLight Junior 256.....	225.00
Joystick Interface (S.Port).....	26.00
Don't pay until you receive your order!	
Cash-on-Delivery is available on orders up to £350 for only £2.50 extra.	
Printers	
LaserDirect HiRes 4.....	1050.00
Spreadsheets	
Schema.....	113.00
Pipedream 3.....	138.00
Utilities	
Articulate.....	19.00
Snippet.....	31.00
MultiFS.....	34.00
Compression.....	48.00
Equisor.....	48.00
ShowPage.....	138.00
Cheques/postal orders should be made payable to SENLAC Computing Ltd. (AU)	
P.O. Box 304 BRIGHTON, BN2 2TT	
Don't forget to specify A3000/Archimedes/A5000!	
Please send a S.A.E for our current price list.	
FontFX.....9.50	
ShapeFX.....9.50	
Glimpse.....9.00	
Investigator 2.2.....25.00	
Speech!.....16.50	
Consumables	
TDK Discs 3 1/2" (box 10)	
DS/DD, 800k.....	11.50
DS/HD, 1.6M (A5000).....	15.00
Virgin Discs 3 1/2" (box 10)	
DS/DD, 800k.....	8.50
DS/HD, 1.6M (A5000).....	12.50
Games	
Air Supremacy.....	19.45
Bambuzle.....	17.50
All prices include VAT, post & packing	
Break 147 & Superpool.....	18.75
Cartoon Line, Part 1.....	19.50
Cataclysm.....	18.75
Chocks Away v2.....	19.00
Chuck Rock.....	22.95
E-Type Compendium.....	18.75
Elite.....	37.95
Enter the Realm.....	18.75
Holed Out Compendium.....	18.75
Hostages.....	16.50
Inertia.....	16.00
Interdictor 2.....	29.95
James Pond.....	22.95
Lemmings.....	22.95
Loopz.....	21.50
Magnetic Scrolls Colln.: Fish, Corruption, Gld of Thvs.....	28.95
Man. Utd. Europe.....	22.95
Master Break.....	16.50
Pandora's Box.....	18.75
Rockfall.....	16.50
Saloon Cars.....	18.75
The Real McCoy 1 or 2.....	24.95
The Thing of Darkness.....	21.95
Tower of Babel.....	19.75
Wonderland.....	27.99

Company Registration No. 2277309

WeServe of Hampshire Educational Specialist

Visit our showrooms. See before you buy.

Taxan 795
Multivision with VIDC
£468.83 (£399.00 + VAT)

Canon LBP-4+
4ppm Laser with cable & paper
£675.63 (£575.00 + VAT)

Arm 3
25 mHt for A400 etc.
£210.00 (£178.72 + VAT)

Philips CM8833 Mk2
Colour Monitor with cable
£219.00 (£186.38 + VAT)

Taxan 775
Multisync Monitor with cable
£433.58 (£369.00 + VAT)

PRINTER RIBBONS
ex VAT Inc VAT
LX800 & FX800 Print Ribbon.....2.29 2.69
LC10 Print Ribbon.....4.00 4.70
120D Print Ribbon.....4.00 4.70
Taxan/Canon Ribbon.....3.22 3.78
Juki 6100 Print Ribbon.....1.60 1.88

Phone for full range 100 + original & Compatible ribbons - Bulk discounts

8271
disk controller chip
£38.26 + VAT

UPGRADES/8271
ex VAT Inc VAT
27128A 250nS 12.5v.....3.00 3.52
8271 controller.....38.26 44.95
6264 LP 150nS.....3.00 3.53
Acorn 8271 DFS.....44.26 52.00
Acorn 1770 DFS.....45.11 53.00
A3 Concept Keyboard.....139.00 163.32
Master Keyboard.....50.21 59.00
Acorn Tracker Ball.....38.30 45.00

NEW A3000
Learning Curve
+Printer +Monitor & Stand
£999.00 inc VAT

A5000 + LC + Printer + Monitor
£1765.00 (£1502.13 + VAT)

A3000 + 2m RAM
£658.00 (£560.00 + VAT)

A3000 LC + 2m RAM
£740.25 (£630 + VAT)

Phone for our 60 Page Catalogue
EDUCATIONAL & GOVERNMENT ORDERS WELCOME
All products have a 30 day money back & 12 month warranty
Prices subject to variation without prior notification
Established 6 years. 3 minutes from M27 Junction 11.
Free parking. Open 9 to 5.30 Mon. to Friday. 9 to 5 on Saturday
Postage 94p (80p + VAT) Securicor £6.46 (5.50 + VAT)

WeServe



Larger items delivered by Securicor



Acorn Dept.
40-42 West Street,
Portchester
Hants
PO16 9UW
Tel: 0705 325354

NEW Citizen 224
Enhanced 24 pin printer, optional colour with easy to use control panel
2 year warranty. Price with cable & paper
£225.00 (£191.49 + VAT)
Optional Colour Kit £26.00 with printer!

Swift 24E
Enhanced 24 pin. Colour printer
2 year warranty. + cable & paper
£275.00 (£234.04 + VAT)

Star
LC20 9 pin £135.00
LC200 9 pin col. £189.00
LC2410 24 pin £182.00
LC20200 24 pin £219.40
LC24200 Colour £275.00
prices include cable, paper & VAT

Citizen 120D+
with cable and paper
£119.00 (£101.28 + VAT)

ROMS/SOFTWARE
ex VAT Inc VAT
Inter-word Rom.....35.75 42.00
Spell Master Rom.....40.00 47.00
View 3 Rom.....40.00 47.00
DTP-Acorn.....120.00 141.00
Impressions 2.....134.47 158.00

Phone for BBC/AS catalogue 100's 100's of titles inc. Educational

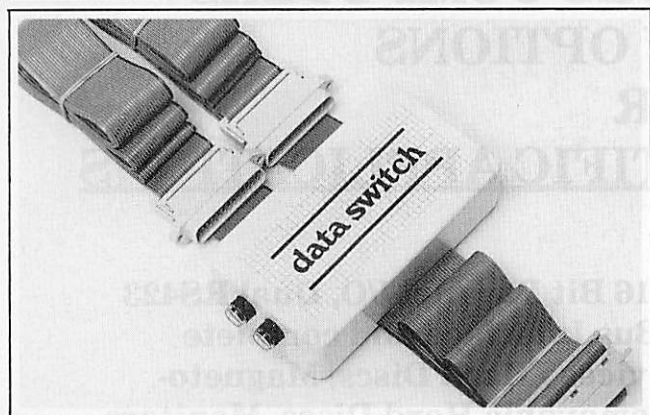
A3000 TV Modulator
£39.90 (£33.19 + VAT)

20M Hard Disk
£139.83 (£119.00 + VAT)

Sony DISKETTES
SONY branded
(100% certified error free)
Inc VAT
10 3.5" DS/DD 135 tpi£7.50
50 3.5" DS/DD 135 tpi£32.31
100 3.5" DS/DD 135 tpi£59.93
1k 3.5" DS/DD 135 tpi£540.50

DISKETTES
(lifetime warranty) SONY bulk (100% certified error free)
Inc VAT
10 3.5" DS/DD 135 tpi£5.95
50 3.5" DS/DD 135 tpi£19.80
100 3.5" DS/DD 135 tpi£37.95
250 3.5" DS/DD 135 tpi£88.42
1k 3.5" DS/DD 135 tpi£339.58
50 x 3.5" Disk Box with lock.£5.99
100 x 3.5" Disk Box with lock.£7.50

PRINTER SWITCH-BOXES



BBC/MASTER'S A3000/ARC/IBMs

PS1 2-way....£31.50	PS5 2-way....£34.50
PS3 3-way....£59.50	PS6 3-way....£67.50
PS4 4-way....£69.50	PS7 4-way....£77.50
PSab 1-ARC, 1-BBC to 1-printer.....£34.50	

COMPLETE WITH ALL CABLES

TERRELL ELECTRONICS

7-B Essex Gdns., Hornchurch, Essex, RM11 3EH
Carriage paid ☎ 04024 71426 Excl. VAT

Staff required

Computer Concepts are expanding and require staff to help in the technical support department to support our ever growing range of Archimedes products. The job would involve providing both telephone and written technical help.

It is not necessary to have any knowledge of our products although some background experience on the Archimedes would obviously prove beneficial.

The company can provide an ideal working environment based in our historic building in the countryside just outside Hemel Hempstead. Facilities include snooker, tennis, pool etc. We can help provide accommodation in the vicinity if necessary.

For more details contact Catharine Moir.



Computer Concepts Ltd
Gaddesden Place, Hemel Hempstead, Herts HP2 6EX
Tel 0442 63933 Fax 0442 231632

Part Exchange

your BBC B, Master 128, A3000 or
Archimedes 400 for a new

Acorn A5000

Please phone for an estimate of the trade-in
allowance for your old system, and for prices
of new systems

Second Hand Computers

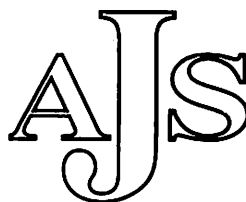
example prices:

Master 128 - £250.00

A3000 - £450.00

A440 - £900.00

plus vat and carriage



Computers

13 Reeves Way
South Woodham Ferrers
Essex CM3 5XF
0245 441312

ACORN ARCHIMEDES COMPUTERS EXPANSION OPTIONS FOR INDUSTRIAL & SCIENTIFIC APPLICATIONS

**HARDWARE - IEEE488 Interface, 16 Bit Parallel I/O, Dual RS423
Serial Interface, 12 Bit ADC, STE Bus Interface and complete
range of STE Bus Boards, SCSI Devices - Hard Discs, Magneto-
Optical Drives, Tape Streamers, Removable Hard Discs, Monitors,
Printers, Plotters, Plus all Acorn Products etc.....**

**SOFTWARE - GINO-F 3D, GINOGRAPH, GINOSURF, HERSHEY +,
VIEWGRAF, VIEWSURF, Termulator etc.....**



**ADVICE - SUPPLY - SUPPORT
INTELLIGENT INTERFACES LTD**

**Established
1981**

PO BOX 80, Eastleigh, Hants, SO5 5YX.
TEL 0703 261514 FAX 0703 267904



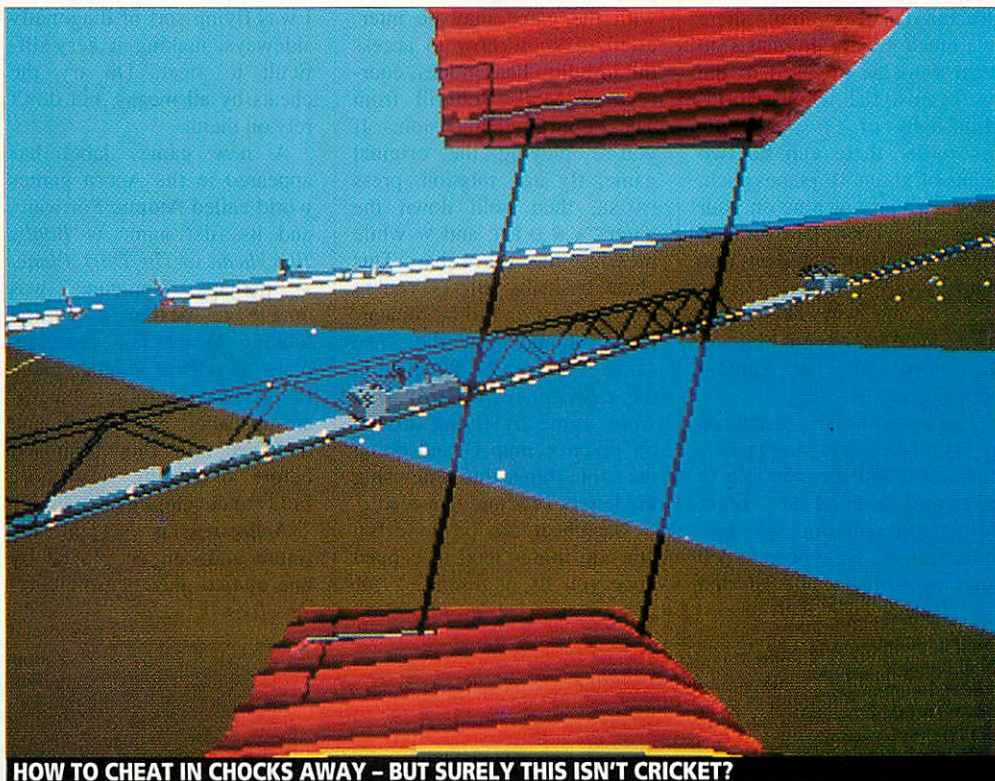
GAME SHOW

The past few years have seen an increase in the use of virtual reality, as engineers not only realise its potential, but also discover that it is possible to produce on just a couple of microcomputers. More often than not Acorn's Risc OS machines play centre-stage in such considerations.

For those not familiar with virtual reality the buzz word is interaction. Whereas in a normal computer game you only react to things happening on the screen in front of you, a virtual reality game attempts to put you inside the world of the computer, to make you feel closer to the game action. The best known results are achieved when the player wears a data suit, which records the movement of limbs and sends signals back to the computer. Meanwhile two tiny colour monitors, contained in the player's helmet, create a game world in 3D that can be seen and touched. When a player moves it feels as though he or she is actually moving around the game scenario.

Acorn machines have been used for experimenting in this area and the Guildford-based company, Simis, helped to produce a virtual reality version of *Interdictor*, shown a while back on *Tomorrow's World*. As yet, nothing is really available to the general public, but at least one project is underway. By the end of this year we might be lucky enough to see the fruits of Ray Maidstone's hard work.

Regular readers may remember that in the *BAU* November 91 Games Supplement we reported that Ray's company was busy at work on the mega game, *Tale of Anubus*. Well, *Anubus* wasn't ready in time for Christmas because the authors did not want to compromise on qual-



HOW TO CHEAT IN CHOCKS AWAY - BUT SURELY THIS ISN'T CRICKET?

ity, but they say that it should be finished for Easter.

Once that's out of the way Ray has four projects (all connected with virtual reality) to be getting on with. These range from a £4000 professional kit (which will appeal to slot-machine arcades somewhat more than to your average family) to a pair of 3D glasses selling for about £10 each. Naturally, an Acorn Risc OS machine will be at the heart of each system.

The professional system will probably consist of a six foot square arena and a player's helmet, which will be totally self-contained to give the user complete freedom. A sit-down version may also be available, for as little as £100, in which players perform a walking motion with their feet as they sit on a chair. However, the helmet itself will still cost

around £200. This is where the 3D glasses may save the day for anyone on a tight budget - as long as you've got two monitors. To create a 3D scene the glasses will simply combine refracted images from two slightly different monitor images, therefore shedding a whole new light on games such as *Gauntlet*.

The systems also have potential in areas such as buying new furniture. By recreating your living room on-screen you can insert sofas and chairs before wandering around to see how it all looks!

As if this isn't enough, Ray Maidstone also has plans for four sequels to *Tale of Anubus*, including a space version and a horror game involving vikings. The latter was originally intended to be made into a film - but Ray thought he could do it better on the Arc. We shall

see. We might also see the release of yet another driving game, one that is very realistic this time. Apparently *Saloon Cars* and *Chequered Flag* aren't quite realistic enough for Ray...

In *James Pond*, the underwater adventures of a secret agent with fins, reviewed in *BAU* February 92, your aim is to save the world from ecological disasters - a task easier to achieve if you cheat! I won't spoil the game, but if you press TAB and then type in the name of a famous guitarist from Sweden, you'll be able to use the number keys on both the keypad and the main part of the keyboard to skip levels and so on. Happy guessing!

It should not be long now before *The Fourth Dimension* releases *Spitfire Fury*, another vintage aircraft game by the author of *Chocks Away*. So

apart from upgrading the Tiger Moth to a Spitfire, what's the big deal? Well, from early screenshots it does look a lot like *Chocks Away* and I would imagine that the plane handles in exactly the same way with roughly the same capabilities, making the two very similar.

The difference is more in the way that the missions are structured. For one thing there is a much greater emphasis on team work as opposed to the 'us against the whole world' philosophy of *Chocks Away*. In *Spitfire* there can be two teams of about 10 planes each, the other eight or nine on your team being controlled for you by the computer. Given that *Spitfire* supports two players in the same way as *Chocks Away*, you can both play on the same side or captain opposing teams.

The missions are structured as six, increasingly large battles and it will be possible to save the game at any point during the mission. A few extra features have been added such as torpedo attacks and

bombing raids but apart from that it looks as though many of the original *Chocks Away* enemies will be rearing their heads once more. Watch out for a review soon to decide whether *Spitfire* is worth buying to add to *Chocks Away*.

On the subject of *Chocks Away*, readers who have struggled and can get no further with the game may be interested to know how to access the in-built cheat modes, courtesy of Mark Botterill from The Fourth Dimension. If you're playing the original game, fly any mission, press PAUSE, then hold down the letters A N D R E and W while pressing the space bar. This cheat basically allows you to fly very fast and to be reincarnated should you die. The same effect can be achieved in the *Chocks Away Extra Missions* game by flying around on practice map C and doing the same thing, this time using the letters T I M and E instead.

The cheat can be quite fun but odd things tend to happen once you fly at mach 2 – for

one thing there aren't any brakes! Also, the bullets can't keep up and you end up firing out of your back.

Stranger things have also been known to happen. For some reason, while flying at some large mach number and fast forwarding at the same time, the computer got a bit confused and before I knew it, I was flying sort of diagonally sideways, making it very difficult to steer. Do try the cheats by all means, but don't rely on them.

A new games label has appeared in the Acorn games world called Atomic Software, and its first game is *Bobby Blockhead vs The Dark Planet* – perhaps, someone was unable to design a normal looking head? The company plans to release another game (a sideways-scrolling shoot-em-up called *Aggressor*), and then see how they both sell before dedicating any more funds to development.

Aggressor is set in the future and can be played by one or two players simultane-

ously. The Earth has been overrun by aliens and much of the human race wiped out, save a small handful that escaped in space ships. Your task is to invade your own planet and rid it of the unwelcome intruders. As is customary in such games there are bonuses to pick up which will enhance your fire power or abilities in some way.

Finally, fans of the highly addictive game *Cataclysm*, from The Fourth Dimension, can look forward to some extra levels. That solves one of the main problems with the original game, there being only 40 levels which don't last more than a week as the game is so addictive. By Easter time another 40 levels will be on sale to keep Cataclysmers going another seven days!

Sam Greenhill

If you aren't already feeling waterlogged from our liquid programme on page 71 then have a go on our playable Cataclysm demo, free on the monthly subscribers' disc.

CONFIGURE

The Fourth Dimension

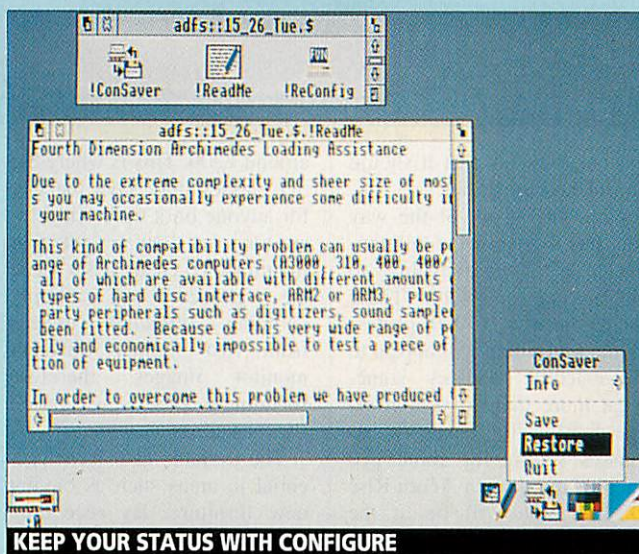
Tel: (0742) 700661

Risc OS machines

Free of charge

Configure is an application, produced for users who find loading software a problem when there's not quite enough memory available – a common occurrence in 1Mb machines. Provided free of charge, it was developed by The Fourth Dimension because its games tend to be fairly memory hungry. However, the company have admitted that it will work with any software giving you memory problems.

The disc contains two applications, and a *ReadMe* file explaining how to use the software. If your game is failing to load properly or cannot claim enough workspace from Risc OS, the application called *ReConfig* is the one to run. It will optimise the settings of certain parameters (stored in the computer's CMOS Ram) to the best conditions for running



a game. However, because CMOS Ram is powered by battery, the changes will be held in the computer even when it is switched off.

You will have set up your machine to your own personal preferences using the *CONFIGURE command, and probably don't want them messed up, which is why *Con-*

Saver is supplied. This will save your machine's CMOS Ram status to disc.

Be sure to use *ConSaver* first! It installs itself on the icon bar, and from the menu you can either save the machine's current configuration – which you should do before running *ReConfig* – or restore a previously saved con-

figuration, which you will probably want to do after playing a game. Of course, if you are experiencing problems running software, there are always a few things you can do before you even need to touch these utilities. The most obvious thing is to try adjusting the memory allocated to different areas of the computer's memory, using the Task display window (accessed via the far right icon on the icon bar).

Anything changed there will not affect the battery-powered CMOS settings, so you can fiddle about as much as you like. If you get in a mess you can always reset the machine to the settings it had when it left the factory by turning it off, holding down the R key and then switching the computer on again, releasing R only when you see the desktop.

If you would like a copy send an SAE to The Fourth Dimension, 1 Percy Street, Sheffield S3 8AU and ask them nicely to post you one.

Sam Greenhill

Q-MASTER

The Fourth Dimension

Tel: (0742) 700661

BBC 5.25in £12.72, Master Compact £13.57 plus VAT

The Fourth Dimension, better known these days for its Arc software, has released a Pool game for the BBC.

Two people can play and the computer will stand in for one or both competitors. The table is viewed from above with the status section at the top and, in practise mode, at the bottom as well. It only uses four colours (one less than the minimum required) so both the cue ball and the number eight are black. Fortunately the latter is marked with a number eight.

To hit a ball you move a crosshair around the screen until it is vaguely over where you want the cue ball to go. Pressing RETURN, or another user selected key, advances the player to a fine tuning session, letting you alter where the cue

hits the cue ball, the angle of the cue to the table and the power of the shot.

Power is measured by an ungraduated bar. However, the keys move the bar at a furious rate and the fine adjust control showed little evidence of working. This seems to be the only skill in the game. A key press plays your shot and there is an action replay option.

Graphics are basic to say the least: the crosshairs are small and hard to place accurately, and the Beeb's nasty shade of green is used to sickening excess, although it does seem to be toned down on the packaging. The sound is similarly unexciting – a bit of white noise and the occasional beep, although arguably that is all that's required.

Although the score tables have to be loaded manually (because none are supplied) it is quite fun to play, the strongest point being the computer player. There are eight



THE BBC TAKES TO THE GREEN BAIZE

levels of difficulty and a novice can equal the computer at level one. However it pots balls with remarkable frequency at higher skill levels. Is Q-Master cheating by peeking at it's own internal co-ordinates? Call me a cynic, but it certainly seems that way!

Overall, it gives an impression of having been written overnight in Basic. I know that the Beeb games market is a bit quiet at the moment but I am amazed that The Fourth Dimension could do no better than this.

James Weeks

THE MAGNETIC SCROLLS COLLECTION

Virgin Tel: 081-960 2255

Risc OS machines

£30.43 plus VAT

Almost a year ago Virgin released Magnetic Scroll's *Wonderland* to an eagerly awaiting public. Somewhat pioneers amongst the adventuring fraternity, Magnetic Scrolls had developed a window environment for the game called Magnetic Windows. Text appears in the Adventure window in the normal way, but with a flick of the mouse you can summon up an inventory, compass, graphics and even a map-making window. Objects can be dragged between windows; to examine one double-click on it. And if this isn't enough, many of the graphics are animated and some versions, though sadly not the Archimedes, have music.

Unfortunately the Archimedes' own desktop wasn't used. Instead, a grey dithered affair with rounded buttons was used, somewhat reminiscent of a waterproof overcoat. This is

a shame, but then we Arc users were lucky to get an adventure of this quality at all. And if you have a multisync monitor, then the environment makes use of it, giving better aspect ratios on the windows and, of course, giving you more screen to work with.

Virgin promised that Magnetic Scrolls' back catalogue would be converted to the Magnetic Windows environment, and sure enough Collection One is now available for

the give-away price of £25. It contains *Fish!*, *Corruption* (both runners-up in the Best Game 1990) and *The Guild of Thieves*. A somewhat odd choice in my opinion; as there have been three Kerovnian adventures – *Pawn*, *Thieves & Jinxer* – why not bundle these and put *Fish!* and *Corruption* in a second collection.

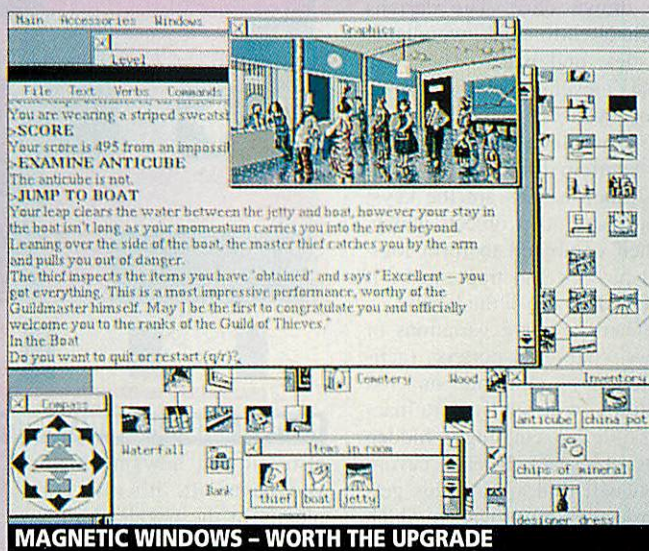
I seem to have covered these games many times in the past, so I'll just give my two word description of each: *Fish!* –

great fun; *Corruption* – very tricky; *Guild* – standard adventure. All have excellent puzzles and well thought out scenarios. New comers should start with *Fish!*, move on to *Guild*, set in very odd places, and finally *Corruption*.

Obviously they are the same as their predecessors although it is nice to see that some of the graphics have been animated, though nothing quite as grand as the Duchess' house and kitchen in *Wonderland* – just a bubble here, a flicker of flame there and the odd deck-chair or two. *Fish!* and *Guild* have their tongues firmly in their cheeks. For example there's an empty stable in *Guild*; if you type SHUT DOOR, it replies 'It's a bit late for that, surely'. Not a game for the serious minded. The full help system provided is a little too easy to access – it's very tempting to take a quick peek. I'd like an option not to copy it when you install the game.

To sum up, an excellent collection of very good adventures. Even if you already have some, it's worth the money to get the window versions.

David Lawrence



MAGNETIC WINDOWS – WORTH THE UPGRADE

KARMA: THE FLIGHT TRAINER

Periscope Software
Tel: (0462) 893107
Risc OS machines
£24.95

Well, *Karma* is here at last, but was it worth the wait? Actually, it's not over yet as Periscope is releasing it in three parts. Part one, *The Flight Trainer*, is simply a front end that lets you fly around the galaxy and explore.

It's a big game, and *The Flight Trainer* is only a small part, coming on two discs. The manual describes your aims, and the laws of physics that shape and effect the universe you will travel in. To load the trainer double-click on the *Karma* icon; it is fully Risc OS-compatible. Part one runs on a 1Mb machine, but the rest will need at least 2Mb of Ram.

You begin in the mother ship, designed for long range, interstellar travel. The control panel and view windows are disappointing to say the least. One shouldn't judge a book by its cover, but in *Karma's* case a little more care over presentation would have made it more interesting.

Sound is minimal, but this is in fact more realistic than



other space games – space is a vacuum, and nothing can be heard in such an environment.

In part one you have to complete the missions set by the Galactic Council, such as locating your Hopper craft, and finding the Council's Training Post. Simple on-board comms let you talk to passing satellites, some of which will pass on vital information. Flying is as realistic as you can get considering the limitations of a mouse and keyboard, although voltmax joysticks are supported.

An autopilot option makes flying around easy. Just select

the object you want to fly to, drop it onto the autopilot window and your ship will head in the right direction. However, large distances take a long time, often requiring a few shorter journeys to aid navigation. A separate navigation display shows the state of your ship's engines, your speed and the distance to the target.

Depending on your distance from a selected object, in-built sensors will provide brief or detailed information. If you select a sun on the other side of the galaxy, only its size and approximate distance are displayed. If you are within a

sun's system far more detailed data can be obtained.

Within a sun's system, any planets in the vicinity will be displayed with full details for each. Considering the size of the galaxy, there are an awful lot of stars and planets to visit – certainly enough to keep you busy until part two is released.

You will occasionally come across other ships and it's here that the promised 3D graphics come into play. All ships are displayed using 'point of light shading', that is the different surfaces get lighter or darker, depending on their relative position to a light source (typically a sun). The effect is pretty good, although if you are looking at a ship with the light source in the distance, it may appear as a grey blob.

After playing (sorry, using) *The Flight Trainer* for a few hours, it soon became obvious that *Karma* is not so much a game as a complete universe simulator. Getting used to flying your ship takes time so buying *The Flight Trainer* can be regarded as an investment for the future releases.

It's hard to judge only part of a program, but the remaining two parts will have to be more involved if *Karma* is to succeed in the long run.

Rob Miller

BOBBY BLOCKHEAD

Atomic Software
Tel: (0733) 53355
Risc OS machines
£19.95 plus VAT

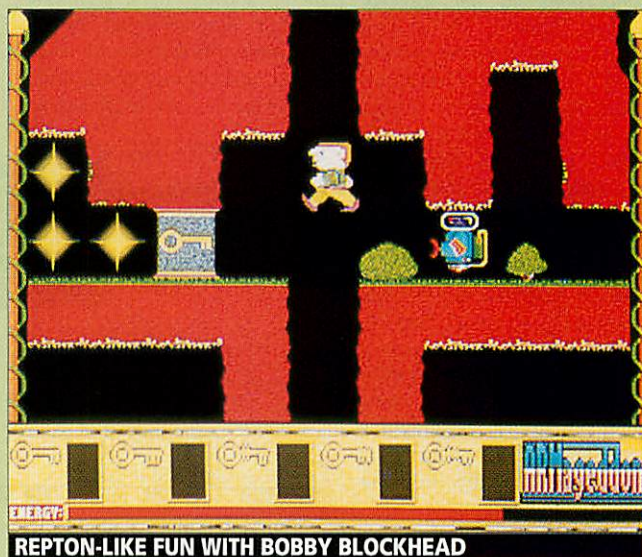
Similar in idea to the old *Repton* saga, you have to journey around a series of caverns, to save the universe using, according to the manual, only your 'skill, luck and fresh-breath confidence'. What gives it an edge is that there are with 25 fiendishly designed large caverns full of wasps, teleporters, keys and doors. Once you have completed a level you receive the passport so you can carry on where you left off.

The graphics are of the reusable block type – the same chunks slot together in many variations. Because they scroll around you in all directions, it gives a smooth appearance.

However, they don't have a professional quality which is a pity – there are relatively few of them and they only had to be drawn once. The designs include earth, rock, woodland, castles, and water. There are also clever blocks, such as those you can only cross one way, or which push you along in a certain direction.

Added to this are the keys, doors and other objects which, when combined to form logical puzzles and traps, make it difficult to finish the levels.

There are five variations of keys and transporters (activated by jumping on red buttons) will send you to inaccessible or cunningly hidden bits of terrain. In each cavern you will find a map (this gets harder as you progress) which you can look at by logging on to a computer terminal. It will



also tell you how much time you have left. It's the complexity of the puzzles built-up from simple components which has always made games

like this fun, and *Bobby Blockhead* is no exception – being on a par with *Repton* at its most addictive.

Mat Tizard



TMJ Computer Software

15 Harborough Rd., Desborough, N'hants. NN14 2QX
Telephone & Fax 0536 762713

What You See Is What You Pay

Arc DFS	26.99	Mig 29 Fulcrum	30.99	Desktop Office	109.95
ArcTerm 7	69.95	Mig 29 Super Fulcrum	31.99	Protext V.5	134.95
ARCticulate	19.99	Nevryon	16.99	**** Educational ****	
Bug Hunter In Space	15.99	PC Emulator	113.99	Fun School 2 : - 6	15.99
Bug Hunter	15.99	Pacmania (Domark)	16.99	Fun School 2 : 6 - 8	15.99
Blaston	16.99	Powerband	19.99	Fun School 2 : 8 +	15.99
Break 147 & Superpool	19.99	Poizone	16.99	Fun School 3-5	21.50
Bubble Fair	16.99	Pandoras Box	19.99	Fun School 3 5 - 7	21.50
Blitz	19.99	Repton 3	16.99	Fun School 3 7 +	21.50
Bambuzle	16.99	Speech	16.99	Lets Spell At Home	20.99
Chocks Away	19.99	Spiffire Fury	77.77	Lets Spell at the Shops	20.99
Chocks Away Extra	16.99	Superior Golf	16.99	Lets Spell out and About	20.99
Chocks Compendium	36.00	Schema	19.99	Things to do w Numbers	21.99
Chess 3D	16.99	Saloon Cars	19.99	Things to do With Words	21.99
Chequered Flag	21.50	The Real McCoy	25.99	**** Hardware ****	
Comprosin	50.50	The Real McCoy 2	25.99	Armadaus Sampler 141.95	
Cartoon Line	21.50	Trivial Pursuit	25.95	Delta Cat	31.99
Catalcysm	19.99	Top Banana	21.99	Arc/A3000 Games Ctrl	35.99
Chuck Rock	21.50	Tower of Babel	21.50	Mouse/Joys. Split.	17.95
ELITE	37.99	World Champ.Boxing	20.50	Micro Mouse	32.00
Enter the Realm	19.99	Wonderland	29.99	VIDI Archimedes	165.00
E-Type Compendium	19.99	World Champ. Squash	21.50	**** Odds and Ends ****	
Fine Racer	16.99	Zelanites	19.99	3.5 inch Disc boxes: 80	7.00
Flight Sim. Tool Kit	38.99	X-Fire	19.99	100	9.00
Grievous Bodily ARM	19.99	**** Music Packages ****		Printer Ribbons	
Holed Out Compendium	19.99	Rhapsody 2	54.99	KXP1080,1081,11180 4.50	
Home Accounts	39.99	Armadaus	69.95	STAR LC10 & NX1000 3.00	
Hostages	16.99	**** Art Packages ****		Citizen 120D 4.50	
Interdictor 2	29.95	Atelier	89.99	Citizen Swift 24	4.50
James Pond	21.99	Render Bender 2	113.99	Epson LC400/500/550/850 4.50	
Lemmings	21.50	Illusionist	89.99	Dust Covers:	
Loopz	21.99	Tracer	55.00	A3000(Keyboard only)	6.99
Mad Professor Mariati	16.99	Clip Art 1	30.00	A3000 & Monitor	9.99
Man U. Football	20.99	Euclid RISC-OS	59.00	Arch. 2pc	9.99
Man U. in Europe	21.99	ARClst 19.99		Mouse mats	3.00
Microdrive Extra Courses	12.99	**** DTP ****		3.5 inch Head Cleaners	3.50
Microdrive World Edition	25.50	Impression II	160.95		
Master Break	16.99	Impression Junior	87.95		

We have moved please note the new address above and telephone number. We regret any inconvenience caused.

MOVING SPECIAL OFFERS

Loads of things available please ring or write.

To many offers to fit in this space.

Such as :

Cumana 1 Meg Upgrade 50.00

Cumana 4 Meg Upgrade
for A3000
£159.00

All prices include VAT and P&P
Access and Visa Accepted
Open Mon-Fri. 9.30am - 12.00
1.30pm - 5.30pm

Everything's a Bargain!

FACT SYSTEMS (BARROW) LTD

UNIT 19, FOCUS 303 BUSINESS CENTRE, SOUTH WAY,
WALWORTH IND. EST., ANDOVER, HANTS. SP10 5NY.

Acorn

AUTHORISED DEALER

SOUTHERN SPECIALISTS

ALWAYS THE FULL RANGE
OF ACORN HARDWARE AND
SOFTWARE ON DEMONSTRATION
IN OUR SHOWROOM

EDUCATIONAL CLIENTS WELCOME

TEACHERS / STUDENTS SCHEME OPERATED

ANDOVER (0264) 334811



Ace Computing

RISC OS Euclid is the best multi-tasking 3D graphics and animation system for the Archimedes. It is effectively a 3D version of Draw.

Mogul makes full use of **Euclid's** unique hierarchical data structure to generate animations of 3D objects with articulated motion and simultaneous camera motion.

ArcLight is a multi-tasking ray-tracer which will generate a realistic Euclid picture, or a complete Mogul film, while you are free to get on with other work.

Tween produces films from Draw files. It uses techniques similar to **Mogul** and generates a film by calculating intermediate frames from a set of key positions.

Splice allows you to edit films produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

Such is the enthusiasm for **Euclid** there is a user group called **Elements**, now in its second year, which provides a quarterly disk containing hints, tips, animations and user pictures.

ArcLight £50
Euclid £70
Mogul £20
Splice £30
Tween £30
(inc.VAT)

Ace Computing
27 Victoria Road,
Cambridge,
CB4 3BW.

Tel: (0223) 322559
Fax: (0223) 69180

SOFTWARE SHOWCASE

EDUCATION

?NEW to Archimedes?

You need our **LOW PRICED 48 page booklets** containing **step-by-step instructions** which bridge the gap between aspects of the A3000 & Archimedes Welcome and User Guides.

Venturing into . . .

a) Dot Matrix Printing --- @ £4

b) Edit --- @ £4


Post FREE (UK) No VAT Total

Send cheque/PO with this advertisement and your NAME and ADDRESS to:

KEITH POWELL,
8 Gibsons Green, Heelands, MILTON KEYNES MK13 7NH.

ENQUIRIES: Milton Keynes (0908) 321476.

EDUCATION



EDUCATIONAL SOFTWARE from STORM is FUN!

Write for an illustrated brochure
STORM SOFTWARE
FREEPOST,
Poynton, Cheshire, Cheshire, Cheshire
Dorset DT9 4BR.
0963 22469

EDUCATION

DataSweet 2 - the popular data handling package for the Archimedes has been updated in response to educational demands.

DataSweet/PC - the established software pack will soon be available for Windows 3 users. It will run on any PC compatible machine including RM Nimbus.

DataSheet - an enhanced spreadsheet based on DataCalc from Lotus.

Banner - a RISC OS sign writing application for printing LARGE text using outline font technology.

For further details, contact:
Kudlian Soft, 39 Dalehouse Lane, Kenilworth, Warwickshire CV8 2HW Tel: 0926 - 55538

Kudlian Soft

The LIST Project
Department of Design and Technology
Loughborough University of Technology
Leicestershire LE11 3TU
Tel: 0509 222661 FAX: 0509 610813

The Technology Database

As reviewed in BBC Acorn User March 1991

A database package of the National Curriculum Orders for Technology*, covering AT's 1-5, Levels 1-10. Designed for ease of use, by any teacher, as an aid in constructing schemes of work.

BBC 'B'/Master £12.00+VAT Archimedes £13.00+VAT

* Crown copyright data are reproduced by permission of HMSO

Stylus A simple introductory Writing Tool for the A3000 / Archimedes. Ideal for early years and special needs, it can also be used with a concept keyboard.

Fantastic value at £12.00 (+p&p)

PRIME RESOURCES

6 Sunbury Avenue Jesmond Newcastle upon Tyne NE2 3HE Tel: (091) 281 1831

NORTHERN MICROMEDIA

Quality educational software and resources developed by teachers for the classroom

For further information contact:
NORIC - Resources Centre - Coach Lane Campus
Coach Lane - Newcastle upon Tyne NE7 7XA
Telephone: 091 270 0424



Make the most of your Archimedes/A3000 with a unique package for primary schools, "Picture It!"

a unique software package specially designed as an aid to the National Curriculum.

"Picture It!" allows children to build up scenes using sets of simple pictures, linked to specific topics currently including History, Geography, Maths, Science, R.E and Design and Technology.

It is exceptionally easy to use, making it an invaluable classroom resource, ideal for younger pupils or those with special needs.

For further information please contact:
Applian Way Software Ltd.,
Old Co-operative Buildings,
Langley Park,
Durham, DH7 9XE.
Tel: 091-373 1389

The convenient SINGLE SOURCE for Educational Software

- All popular educational programs available at publishers prices or below including Mirasoft, 4 Motion, Sherston, Resource, E.S.M. Chalksoft, Macmillan, Bourne and over 50 other publishers.
- Wide range of formats: Not only BBC, Archimedes, Nimbus, but also a wide selection of programs for Spectrum +2/+3, Amstrad, Nimbus, Commodore 64/Amiga, Atari ST, IBM-PC and others!
- Vast stocks: 30,000 programs always available for immediate delivery.
- Unconditional guarantee: problems rectified by expert staff - telephone helpline also available.

THE EDUCATIONAL SOFTWARE DIRECTORY describes and prices hundreds of programs

Write or phone for a free copy:

RICKITT EDUCATIONAL MEDIA
FREEPOST - Ilton - Ilminster - Somerset TA19 9HS
Telephone 0460 57152 - Fax 0460 53176

Please state the ages of your children and make of your computers

UTILITIES

BROKEN MOUSE?

PREFER TO USE THE KEYBOARD?



Aid-Set Software makes all mouse functions available from the keyboard including latching, dragging, selecting from menus and adjusting the mouse speed.

Only **one** key press to access all window icons.

A **MUST** for all users who are inaccurate using the mouse.

Keys easily assigned to suit the user.

Archimedes A3000 and A5000 Compatible.

Send cheque for £30.55 inc VAT & P & P to:
Le Computer FREEPOST PO Box 29
Chelmsford Essex CM3 1BR

0245 362225

Sales * Repairs * Special Needs * Teachers Scheme
Home and School Events

MUSIC

TED KIRK

THEORY OF MUSIC Questions and Exercises

LEVEL 1 THEORY OF MUSIC - tutorial

each: Arc £16 Compact £16 Master £15
BBC B (80-track) £13.50, (40-track) £14.50

PLAY WHAT I PLAY - a music game

Arc £13.50 Compact £13.50 Master/B £12.50

5000 NOTES (AMPLE music) Master/B £3.95

Ted Kirk (BAU) 33 Humber Crescent, ST. HELENS,
Merseyside WA9 4HD (0744 818761)

LANGUAGES

KEYLINK PROLOG V2.0 For the Archimedes

- * Uses standard Edinburgh syntax.
- * Comes with 120 page tutorial/manual developed especially for the first time Prolog user.
- * Fully integrated into the RISCOS WIMP environment.
- * Suitable for use with large Prolog programs such as the Open University's public domain MIKE system for Knowledge Engineering and Expert System development making it ideal for these components of A' level syllabuses.

£69.95 + VAT (postage included).

Keylink Computers Ltd, 2 Woodway House, Common Lane, Kenilworth CV8 2ES. Tel/Fax: 0926 50909

SOFTWARE SHOWCASE

PUBLIC DOMAIN



Demo Disc 9
With 16 Page Catalogue



Demo Disc 9 Crammed with over 1600k of new PD software.

Order the Offer Pack below, for just £6, or send a £1 coin for Demo 9.

- F98 Bobby Blockhead Demo
- F99 Arc Angels Mega Demo
- J31 Archivist Demonstration Version
- G93 8 Bit Stereo Sound Tracks
- +++ Arcaynia Demo Package 9 +++

PO Box 1927 : Sutton Coldfield : B74 3QZ

PUBLIC DOMAIN

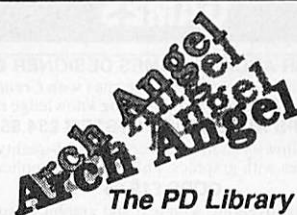
Only One Public Domain Library Gives You ;

Over 500 Discs,
Risc BudgetWare,
A PD Club Newsletter,
Visa & Access,
& Telephone Support.

Skyfall

The Skyfall Printed Catalogue & Winter Demo Disc are available by Sending a \$1 Coin to;

SkyFall, PO Box 2220,
Birmingham. B43 5RZ.



Over 400 cram-packed discs of the best Archimedes Public Domain Software.

Unlike other libraries you can pick 'n mix the programs you want. Just £1.10 per disc for our own compiled discs or £1.50 for the pick 'n mix service.

What the press say:

The best organised catalogue of any of the PD suppliers I've seen. Arch Angel has a full list of software which is worth exploring in detail. (BAU Oct91).

The complete catalogue of all Arch Angel PD discs is presented in a very helpful menu system. This makes choosing and ordering software as easy as pie. Other PD libraries should take note as this feature gives Arch Angel a big advantage. (Archimedes World Dec91).

NEED WE SAY MORE?

For the latest catalogue with Arch Angel's unique 'Pick n Mix' feature, please send a £1 coin to: Arch Angel PD, 2 Bridge House, 17 Lower North Street, Exeter, EX4 3ET. Any cheques payable to Sean Creech.

Fonts

Make your own
Italics

For £10 you can have 'Italic', the the program to transform Arc outline fonts for use in any other application.

Design Concept
30 South Oswald Road
Edinburgh EH9 2HG



☎ 031 668 4518

Call for our free catalogue including fonts or send £12 inc. p&p

SELECTIVE

COMPUTER SERVICES

DESK TOP PUBLISHING - SALES
'HOME AND SCHOOL EVENTS'
TEACHER'S PURCHASE SCHEME
0% Finance on Learning Curves
DERBY (0332) 690691

!!VARIOUS!!

SIGNWRITER
for the BBC & Archimedes

Professional quality lettering that keeps it's smooth outline at any size for 1/2" to max printer width 8" (BBC) Produce quality Banners, Posters,

Letterheads, Adverts, Signs, Tickets & Notices in minutes.

BBC Disk £29.95 -

Archimedes £39.95

Black & Coloured Ribbons for many printers. Please ring for availability and prices.

(All prices include VAT and Delivery)

WIGHT SCIENTIFIC
44 ROAN STREET, GREENWICH,
LONDON SE10 9JT
Telephone 081-858 2899 Fax 081-863 4416

Access and Visa accepted

ARCHIMEDES PUBLIC DOMAIN

LOWCOST = THE BEST NAME IN PD

SEND for LOWCOST PD's latest catalogue/demo disc. It contains full details of all our exciting £1 discs. YES, JUST £1 a disc!

Nothing but the BEST at LOWCOST PD!

Please send a £1 coin or £1 cheque made payable to J. Michalski for our catalogue/demo disc to:

LOWCOST PD (LC PD), 6 FURZELAND HOUSE,
SHEEPHOUSE WAY, NEW MALDEN, SURREY, KT3 5PH.

The
CATSTREAM

32 Hollinwell Ave, Wollaton, Nottingham NG8 1JZ



The Data Stream is pleased to have taken over the Telster Public Domain library and will be supplying PD to even more customers!

Why not order the brand new Catalogue disc IV and the new 54 page catalogue II with over 500 discs of great PD. Send a cheque made payable to "The Data Stream" or a £1.00 coin for yours!

BUSY BEE

5 PD DISCS £4.50.

DEMO No.2, PD & SOFTWARE CATALOGUE £1

Special offers on Archimedes software including Educational now available.

Fun School 3 £21.50, Freddy Teddy 3-7 £20, Spell Week/Week 6-14 £21.95, Imagine £36.95. Tiny Logo/Tiny Draw £31.75, Magpie £45.80.

Air Supremacy £20.50, All In Boxing £12.95, Lemmings £22.99, Manchester United £22.99, Articulate £20.50, Chuck Rock ONLY £22.99, Elite £37.50, The Real McCoy 1 & 2 £24.50 EACH.



BLANK DISCS 3.5" DS/DD. (BRANDED)

10 for £5 or 25 for £12.

Prices quoted include VAT & Del. UK.

Delivery Europe £2.50. Rest of the world £4.50

PO/Cheques to:- BUSY BEE COMPUTERS LTD.
PO Box 25, Ormskirk, Lancs L39 3QR.

Tel: 0695 573825

TO ADVERTISE IN SOFTWARE SHOWCASE

CALL
AREEF VOHRA
071 490 1444

SOFTWARE SHOWCASE

GAMES

CREATOR ARCADE GAMES DESIGNER £38.95
Produce your own arcade-style games with *Creator*. No BASIC or ARM code programming knowledge needed.

ALPS ADVENTURE SYSTEM £34.95

ALPS allows you to create commercial-quality text adventures with graphics. Full RISC OS application.

COPS £19.95

A humorous adventure with text and graphics - spend a day as a cop on Hall Street and find the kidnapped Chief.

PLAGUE PLANET £14.95

A tough sci-fi text adventure with over 250 locations.

UK P+P free on all orders. EC: £2.50, Outside EC: £3.50

ALPINE SOFTWARE, Dept (BAU5) Tel: 0762 342510
PO BOX 25, Portadown, CRAIGAVON, BT63 5UT

UTILITIES

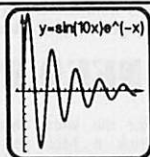
!DrawAid

Produce !Draw files as varied as these from your own BASIC programs.

!DrawAid comes with an Introductory Tutorial, a Reference Guide, and numerous Example Programs.

PRICE £10 including postage, no VAT or send SAE for information sheet.

CARVIC Manufacturing,
Moray Park, Findhorn Road,
FORRES, Moray IV36 0TP



SCANNING SERVICES

HOBBYIST

DTP

FUN

BUSINESS



DOCUMENT

AND

PICTURE

SCANNING

DTP-Scan

HIGH QUALITY COLOUR & B/W SCANNING
FOR ALL ARCHIMEDES USERS INC.A5000

AT SENSIBLE PRICES

ONLY £4.60 FOR 6" x 4" COLOUR PICTURE
INC. DISC AND RETURN POSTAGE

* UP TO A4 SIZE * UP TO 400 DPI *

Call 061-445 0191 for Free Information Pack
Or send Picture/Doc. stating Mode reqd.(15/21)
and available computer memory (1/2/4 Mb) to:

DTP-Scan 27 Broad Oak Lane
East Didsbury Manchester M20 0QB

DTP

POSTSCRIPT BUREAU

Postscript Files output to:

Bromide

Film

**Canon Colour
Visuals**

**Adelphi Graphics
(Photosetters) Limited**

52 Rosebery Avenue, London EC1R 4RP

Telephone: 071-278 6926

Fax: 071-833 2605

Modem: 071-837 7415

Phone for price list

ACORN USER ADVERTISEMENT PAGES - MARCH 1992

4-Mation	112	Dabhand Computing	64-65	Kendal Computer Centre	105	Simtron	88
4th Dimension	89-104	Datafile	118	Keylink Computers	132	Skyfall	133
5 Star Marketing	133	Datastream	133	Krysalis Software	122	Software Bargains	115
		David Adamisk	134	Kudlian Software	132	Storm Software	132
Ace Computing	131	Dec Data	33			Superior Software	OBC
Adelphi Graphics	134	Design Concept	133	Le Computer	132		
Alpine Software	134	Desktop Projects Ltd	110-111	Longman Logotron	11	T.M.J. Computer Software	131
Alsystems	55	Digital Services Ltd	IFC	Loughborough University	132	Technomatic	72-73
Ampsound	105					Ted Kirk	132
Appian Way	132	Electronic Font Foundry	32	Manor Court Supplies	88	Terrell Electronics	125
Arcaynia P. D.	133	Evolution Computers	118	Micro-Aid	88	The Data Store	108
Arch Angel Ltd.	133			Minerva Software	63	The Serial Port	48
Atomwide Ltd.	19	Fact Systems Ltd.	131	Morley Electronics	80	Timestep Weather Systems	52
AVP Computing	108						
		Gnome Computers	60	Northern Micromedia	132	Warehouse	23
Beebug	6, 8, 52	Greyhound Marketing	60	Norwich Computer Services	33	Watford Electronics	34-47
Broomfield Electronics	126	Ground Control	105			We Serve	125
Busy Bee Computers	133			Oak Solutions	20-21	Wight Scientific	133
		HCCS Associates	17	Orion Computers	30-31		
Carvic Manufacturing	134	HS Software	132				
Chameleon Computers	52			PRES	28		
CJE Micros	77	Ian Copestake		Prime Resources	132		
Clares Micro Supplies	14	Software	1,4-5				
College Computers	26-27	IFEL	108	Rickett Educational Media	132		
Colton Software	2	Integrex	135	RJM	54		
Compu-teck	69	Intelligent Interfaces	126				
Computer Concepts	12,56-57,126			Selective Software	133		
Computer Focus	118	John Wiley & Sons	60	Senlac Computing	125		
Contex Computing	33	JR Electronics	33	Serious Statistical Software	132		
CSS	52	Keith Powell	132	Simis Ltd	IBC		

COLOURJET 2000

COLOUR INK JET PRINTER

Compatible with:-

IBM pc
Archimedes
Nimbus
BBC Micro

NEW

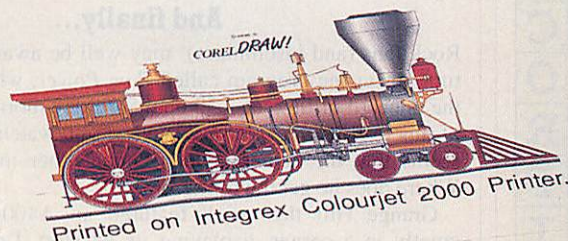
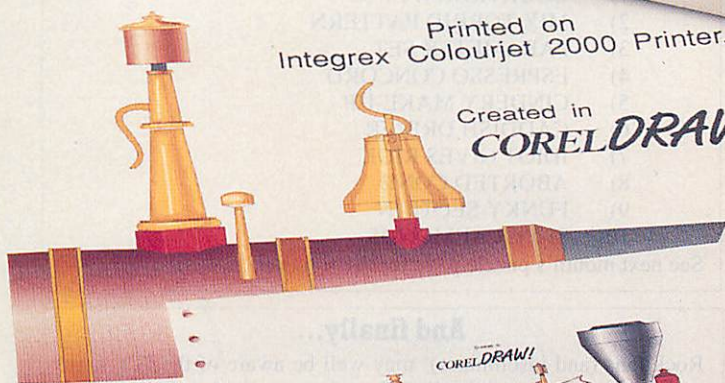
UP TO 200 CHAR/SEC
Emulates Colourjet 132
100% compatible with HP PAINTJET
and Windows 3
Prints overhead transparencies



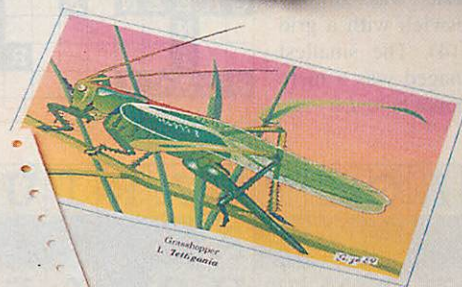
LOW COST

Printed on
Integrex Colourjet 2000 Printer.

Created in
CORELDRAW!



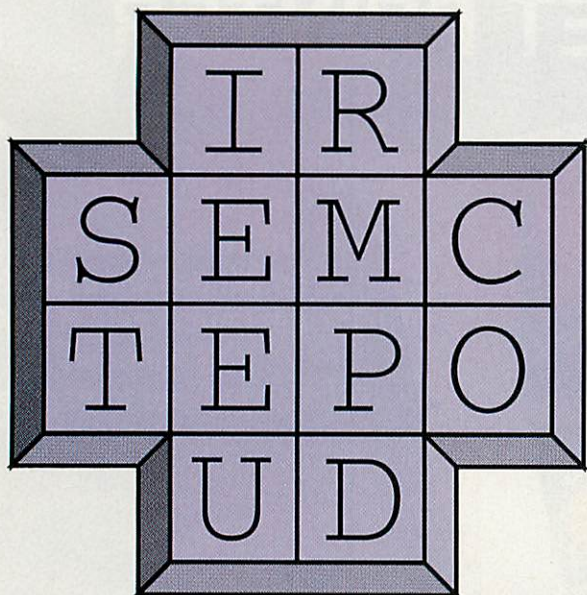
Printed on Integrex Colourjet 2000 Printer.



EDUCATIONAL DISCOUNTS AVAILABLE

INTEGREX LTD., CHURCH GRESLEY, SWADLINCOTE
DERBYS DE11 9PT
Tel (0283) 551551
Fax (0283) 550325
Tlx 341727 INTEG X

£25 prize Pathword

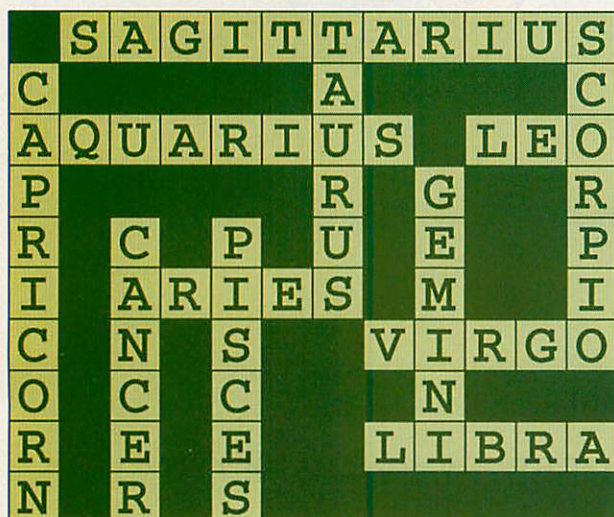


How many words of 4 letters or more can you find in the Pathword grid? Move horizontally, vertically or diagonally between letters using none twice in a word. There is one 12 letter word. No proper nouns, plurals or abbreviations please. Average: 65, good: 80, excellent: 100+.

Once you have found all you can, send your list to: March competition, BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. Please write on the back of your envelope the number of words you found. The winner will be the person who found the most words (including the 12 letter one). Closing date is Friday 13th March 1992. The solution and winner will be published in the May issue.

The winner of January's Juggler puzzle was Antony Marsh of Ipswich with a grid of 126 (9x14). The smallest grid we managed was a mere 12x10, as shown below.

Solution to February's Colour Scheme



Zombie, zombie!

For our foray into the one line entertainment world this month, we present a mono-linear version of that classic ZX-81 era game Zombies. You play the part of Captian Xiran and you must rid the land of the hideous Zombie horde. The zombies are both unbelievable strong (one touch or 'zombie hug' and you're zombie lunch) and incredibly stupid (they have no battle strategy at all, they simply home in on your position). They are also very short sighted, and this is your one advantage. The playing arena is dotted with many holes (white squares) and a zombie will die if it falls into one. You are free to move around the arena with Z, X, SHIFT and CTRL but you will also perish if you fall into a hole, so watch your step. The game ends when you die or you dispatch all the zombies.

The expanded listing is shown on the right. You'll need to compress it with the function key definition, shown below, to fit it all on one line.

```
10 f=40
20 MODE7
30 b=HIMEM
40 REPEATVDUTRUE-223*SG
  N(VPOS MOD23*POS MOD
  39*(3ANDRND))
50 UNTILVPOS=24
60 u=4^7
70 FORv=u TOu+127STEP4
80 !v=RND(20)+f*RND(22)
90 NEXT
100 !u=475
110 REPEAT
120 w=v
130 REPEAT
140 v=(v+4)ANDNOT128
150 UNTILACSv?2
160 j=u=v
170 b?!v=0
180 !v=!v-j*(INKEY-98-IN
  KEY-67+f*(INKEY-2-IN
  KEYTRUE))+SGN(!uMODf
  -!v MODf)+f*SGN(!u-!
  v)
190 v?2=b?!v/255
200 b?!v=(1-v?2)*(90+2*j
  )
210 UNTILu?2OR!v=!u*(1+j
  )ORw=v
```

```
*KEY0 f=PA.+4:t=f:b=&F5:REP.c=(b<>&F5):?t=-?t*NOTc-58*
c:t=t-c:x=f?-1:FOR i=1TOx-4:b=?f:?t=b:f=f+1:t=t+1:N.:f
=f+4:U.f?-3=&FF:?t=&D:t?1=&FF:?(PA.+3)=t-PA.!
```

Mixed Bag

The following list contains 10 things that could be part of your computer system. Can you unscramble what they are?

- 1) COURTROOM LINO
- 2) MIX TORRID PATTERN
- 3) PARAMETER SET
- 4) ESPRESSO CONCORD
- 5) CINDERY MAKE-UP
- 6) CADDISH DRIVER
- 7) IDIOT GIVES RIDE
- 8) ABORTED CONE
- 9) FUNKY SECTION
- 10) SUPER ALMONDS

See next month's puzzle page for the solution.

And finally...

Rock fans (and insomniacs) may well be aware of the ITV night time magazine program called *Raw Power*, which is broadcast at the unheard of time of 3.30 on a Saturday morning. The relevance of this to *BBC Acorn User*? Well, if you watch right to the end, it seems that the camera man is none other than Ian Copestake! Where does he get the time from...

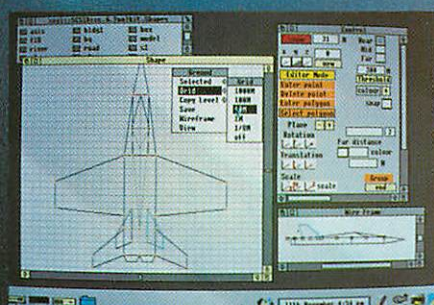
Grange Hill this week featured an A400/1 machine sitting quietly in a corner displaying its desktop. I'm afraid I'm not a regular watcher of the program so I don't know who was 'operating' it, but in the said scene, one teacher said to the other "All you have to do is boot it up". He followed this by pressing the RETURN key. Perhaps he'd written an IRQ routine to trap RETURN and make it generate SHIFT BREAK instead...

The loos in Acorn's Fulbourn Road offices have amazingly complicated instructions on the hot air drier, which describe in great detail the optimum way to dry your hands. Luckily there's a pull-towel on the wall, for the less technically minded...

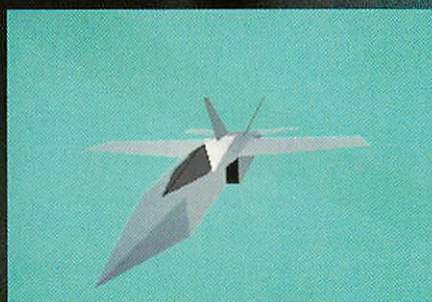
INCLUDES TWO FREE
GAMES CREATED USING
THE "FLIGHT SIM TOOLKIT"

FLIGHT SIM TOOLKIT

*The flight sim toolkit contains 5 Risc OS tools
which let you create your own flight simulator!*



!Shape – Design aircraft, building, runways, roads and rivers.



!Model – Aerodynamic a/c model editor.



!Cockpit – Design instrument panel and displays.

!World – Create your virtual world, set up enemy airfields, defences and supply lines.

RRP
£44.95

Available from: Simis Limited, 26 Chitty Walk, Keens Park, Guildford, Surrey GU3 3HW
Telephone: (0483) 233048



ACORN ARCHIMEDES TITLES FROM SUPERIOR SOFTWARE



SPEECH!

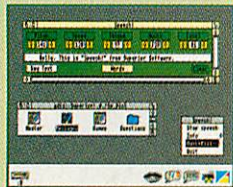
Give your computer a voice with this high quality speech synthesiser, which is both easy to use and very flexible. It can directly speak words you input or text files, or you can use phonetic input to add stress/intonation, speak foreign languages or even sing! An easily modified spelling program is included.

"For just 20 quid, Superior is offering a bargain here" ...Computer Shopper (Aug. 91)

"The most sophisticated of the speech programs" ...Special Solutions News - Acorn Computers (Autumn 91)

"Unquestionably the best buy" ...Micro User (July 91)

£19.95



AIR SUPREMACY

In this unique game, you can swap between air and ground/sea forces as the battle develops. Practise with the biplanes and tanks of 1918 Europe, the fighters and gunboats of the Pacific 1944, and the guided missile jets and desert tanks of the Gulf 1991. Then to 2150 and the final challenge!

"The sense of speed when flying around is excellent. Skimming along the ground in a stealth fighter is particularly fun" ...BBC Acorn User (Dec. 91)

"The ultimate dogfighting game - will take weeks of intensive play to complete - sinks its hooks into you and doesn't let go" ...Archimedes World (Dec. 91)

£24.95



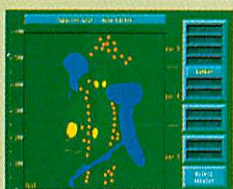
SUPERIOR GOLF

plus CONSTRUCTION SET

The complete golfing game for 1 to 4 players, designed exclusively for the ARCHIMEDES. Realistic gameplay with a choice of six courses (St Andrews, The Belfry, Victoria and three Sea Palms courses), plus Driving Range and Practice Green. Full feature hole and course design and editing facilities.

"Technically brilliant, graphically excellent and incredibly playable. Worth going a fairway to buy" ...A & B Computing (now Archimedes World) (Dec. 90)

£19.95

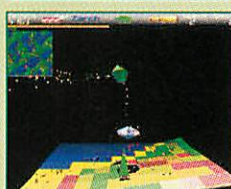


ZARCH

David Braben, co-author of ELITE, has harnessed the speed and performance of the ARCHIMEDES to create a programming masterpiece. Nerve-tangling gameplay over a massive 3-dimensional landscape, with realistic area shading and accurate perspectives. Totally addictive.

"LANDER - which is supplied with the Acorn equipment - is fun; ZARCH is a game. ZARCH has a map, it has a string of bad guys and most importantly of all it has a series of challenges that develop as you play the game. And that's what gives it the quality possessed by the greatest games" ...BBC Acorn User (Nov. 91)

£19.95



CONQUEROR

Step into a tank of your choice and experience the thrill of controlling one of the most powerful land vehicles in the world, in a 3-dimensional landscape of roads, hills, villages, rivers and woodland. Choose the Arcade or Attrition games to develop your skills, and then ultimately the Strategy game, a full battle simulation with up to 16 tanks per side from American, German or Russian forces.

"What I want is a thinking man's shoot-em-up and CONQUEROR fits that bill" ...Micro User (May 88)

"A highly addictive tank simulator" ...Learning Curve Magazine (Aug. 90)

£24.95



HOSTAGES

The highly acclaimed, top-hit ATARI/AMIGA game, now reaches the ARCHIMEDES. Commando action and strategic planning as you rescue the hostages from the besieged embassy. Brilliant, realistic graphics and exciting gameplay...superb digitised sound effects and tunes...keyboard or mouse control.

"Graphically the game is very nice indeed. Your men run around, jump, leap, roll and die with great aplomb and the animation of them is excellent" ...A & B Computing (now Archimedes World) (Dec. 90)

£19.95

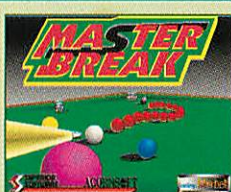


REPTON 3

Four of the most popular strategy games ever produced for Acorn computers in one great value-for-money package. Four complete Repton games - REPTON 3, AROUND THE WORLD IN 40 SCREENS, THE LIFE OF REPTON and REPTON THRU TIME - with choice of four tunes and a position Save/Recall facility, plus easy-to-use screen and character design and editing facilities.

"REPTON 3 is an on-screen strategy program which children from seven upwards simply adore. No library of games software is complete without REPTON 3 - it is a must" ...BBC Acorn User (Nov. 91)

£19.95



MASTER BREAK

A snooker-style trivia quiz for 1 to 4 players. Over 2000 questions on SCIENCE & NATURE, POP MUSIC, GEOGRAPHY, SPORTS & PASTIMES, ARTS and HISTORY. Digitised pictures include: sport and pop stars, famous places, animals and world leaders. Amusing and educational. Can you get the maximum break of 147?

"The digitised pictures and sounds are very nice indeed. The timer really adds atmosphere - I panicked the first time I tried to answer a black question...it's good to play on your own or with friends" ...Micro User (Mar. 91)

£19.95



SPEECH!, HOSTAGES, MASTER BREAK and the REPTON games are also available for the BBC MICRO/MASTER and ELECTRON computers. Please write to the address below or telephone for a full list of our BBC MICRO/MASTER (including MASTER COMPACT) and ELECTRON titles.



ACORNSOFT

(Superior Software is a trading name of Superior Microcomputing Ltd.)
Dept. 4E, P.O. Box 6, Brigg, S. Humberside DN20 9NH. Tel: (0652) 658585

PLEASE MAKE CHEQUES
PAYABLE TO "SUPERIOR SOFTWARE."



24 HOUR TELEPHONE
ANSWERING SERVICE FOR ORDERS

OUR GUARANTEE

- All mail orders are despatched by first-class post
- Postage and packing is free
- Cassettes and disks that are faulty on receipt will be replaced immediately

(This does not affect your statutory rights)